

ILLUSTRATED CATALOGUE
OF
ASH'S MINERAL TEETH.



CLAUDIUS ASH, SONS & Co. LIMITED,
LONDON, W.



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ILLUSTRATED CATALOGUE
OF
ASH'S
MINERAL TEETH.



CLAUDIUS ASH, SONS & CO. LIMITED,

5-12, BROAD STREET, GOLDEN SQUARE,

LONDON, W.

ESTABLISHED 1820.

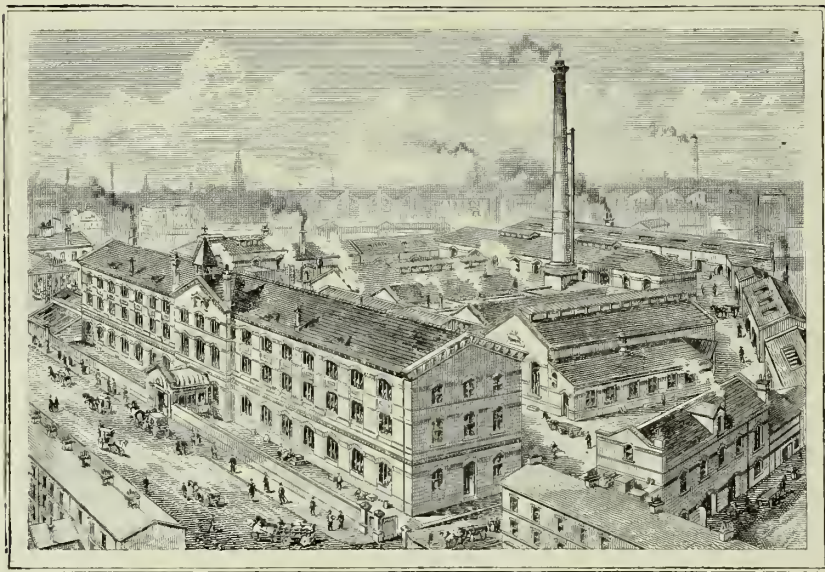
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INTRODUCTION.

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INTRODUCTION.

MINERAL OR PORCELAIN TEETH.

EARLY BEGINNINGS.

THE world is indebted to France for the invention of Mineral or Porcelain Teeth, and without going into the vexed question of priority, the members of the dental profession may fitly hold the names of Guillemeau (1710), Fauchard (1728), Duchateau (1774), Dubois de Chemant (1788), and Fonzi (1808) in honoured remembrance; they represent the invention from the original conception in the middle of the 18th century, to the finished product in the early part of the 19th century.

Of these various pioneers here mentioned, Dubois de Chemant in 1788 published the first edition of his French work **Sur les avantages des nouvelles dents, et rateliers artificiels, incorruptibles sans odeur**, Paris, and these Teeth were favourably reported upon by M. M. d'Arcet and Sabatier, of the Royal Academy of Sciences in 1789. Dubois de Chemant, who was then practising as a surgeon in Paris, removed to London, patented the Teeth of his invention, both in France and England, and the material of which they were made is described in his English Specification, dated May 11, 1791, as "A composition for making Artificial Teeth, either single, double, or in rows, or in complet setts, which said Teeth may be made of any shade or colour, which they will retain for any length of time, and will consequently more perfectly resemble the natural Teeth than any now made". In the fifth edition of his English work (1816), **A dissertation on Artificial Teeth; evincing the advantages of Teeth made of Mineral Paste over every description of Animal Substance**, Dubois de Chemant continues to dwell upon the value of his invention, but his Mineral Paste Teeth were not commercially available to the Profession at large; to judge from the following statement their use was confined entirely to his own practice: "As I make every piece myself, I can give them a greater resemblance to nature than if they passed through different hands".

A GREAT STEP FORWARD.

From 1816 to 1837 various crude forms of porcelain teeth were made by dentists for their individual requirements, but the records do not show that there were any produced on a commercial scale.

A great advance was made when CLAUDIUS ASH introduced tube teeth in 1837, and from that time onwards carved ivory blocks and the use of natural teeth, which were then so generally employed, were gradually displaced, and to-day they are classed amongst the curiosities of the past.

INTRODUCTION.

EXPRESSION AND TEMPERAMENT.

With the growth of the practice of dentistry and the multiplication in variety of the materials employed, the most advanced members of the Profession have made it their aim to avail themselves of the wide culture of such eminent men as the celebrated surgeon, Sir Charles Bell (1774-1842), whose classical work on **The Anatomy and Philosophy of Expression**, served to awaken interest in the artistic restoration of the mouth and features, and Drs. Gall (1758-1828), and Spurzheim (1776-1832), whose labours in the science of Phrenology have resulted in attention being directed to the four primary temperaments in human beings which are thus classified by **Dr. Spurzheim** :—

1. The Lymphatic Temperament.—The Lymphatic or Phlegmatic temperament is indicated by pale white skin, fair hair, roundness of form, and repletion of the cellular tissue. The flesh is soft, the vital actions are languid, the pulse is feeble; all indicate slowness and weakness in the vegetative, affective, and intellectual functions.

2. The Sanguine Temperament.—The Sanguine Temperament is proclaimed by a tolerable consistency of flesh, moderate plumpness of parts, light or chestnut hair, blue eyes, great activity of the arterial system, a strong, full, and frequent pulse, and an animated countenance. Persons thus constituted are easily affected by external impressions, and possess greater energy than those of the former temperament.

3. The Bilious Temperament.—The Bilious Temperament is characterized by black hair, a dark yellowish, or brown skin, black eyes, moderately full, but firm muscles, and harshly expressed forms. Those endowed with this constitution have a strongly marked and decided expression of countenance; they manifest great general activity and functional energy.

4. The Nervous Temperament.—The external signs of the Nervous Temperament are fine, thin hair, delicate health, general emaciation, and smallness of the muscles, rapidity in the muscular actions, vivacity in the sensations. The nervous system of individuals so constituted preponderates extremely, and they exhibit great nervous sensibility.

From these four basal temperaments are derived the binary or compound temperaments — Lymphatico-sanguine, Lymphatico-bilious, Lymphatico-nervous, Sanguo-lymphatic, Sanguo-bilious, Sanguo-nervous, Bilio-lymphatic, Bilio-sanguine, Bilio-nervous, Nervo-lymphatic, Nervo-sanguine, Nervo-bilious.

INTRODUCTION.

THE TEETH IN RELATION TO TEMPERAMENT.

In the construction of Artificial dentures the selection of suitable teeth will be facilitated by the study of the temperaments of patients on the lines described on the preceding page, and with reference to the following notes.

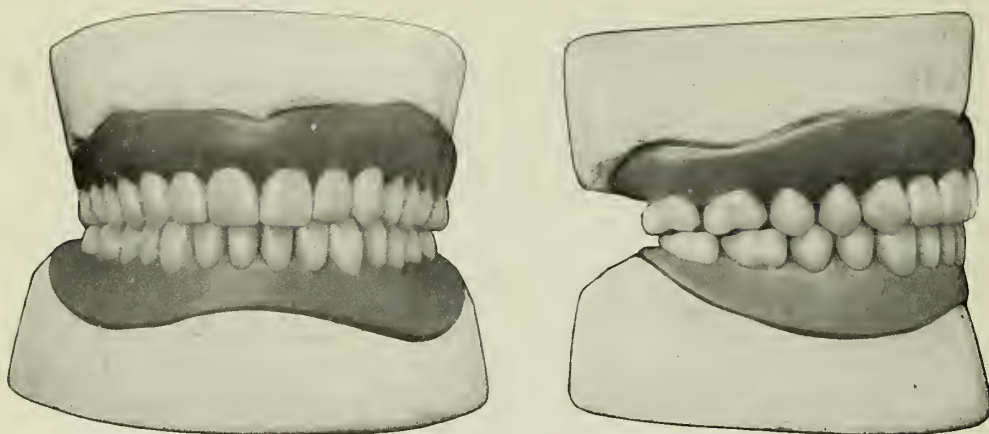
	LYMPHATIC.	SANGUINE.	BILIOUS.	NERVOUS.
COLOUR	Opaque and Muddy	Cream Yellow to Dark Yellow	Yellow to Brown Yellow	Light Greyish Yellow, or Pearl Blue
SHAPE	Breadth predominating over length	Rather long teeth, big broad Molars and well proportioned	Well formed, rather long in proportion to breadth, Centrals and Canines very prominent, narrow jaw with incisal edge curved	Fine broad cutting edges, well rounded Molars
SURFACE	Devoid of markings, smooth and expressionless	Well defined longitudinal markings	Transverse ridges with strong lines	Faint transverse markings at neck of tooth, pronounced longitudinal markings towards cutting edge
ARTICULATION	Incisors almost edge to edge, Bicuspids and Molars flat, Incisors abraded	Fair overbite, Molars almost flat for rotation of jaw during mastication. Two Centrals nearly square to the mouth, angle commences with the canines	Firm, well locked Molars and Bicuspids, curved lines	Good, strong overbite, slight curve in setting up, with Laterals slightly turned out

It is scarcely necessary to add that in nature these divisions are so blended and commingled that it is very rare to find an individual whose temperament belongs wholly to any one class.

INTRODUCTION.

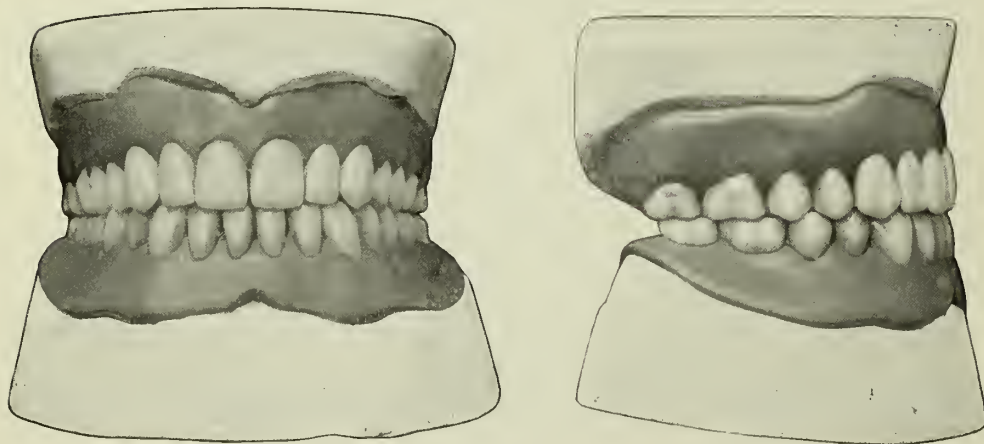
LYMPHATIC TYPE.

(TYPICAL SET No. 25, PAGE 47.)



SANGUINE TYPE.

(TYPICAL SET No. 82, PAGE 50.)

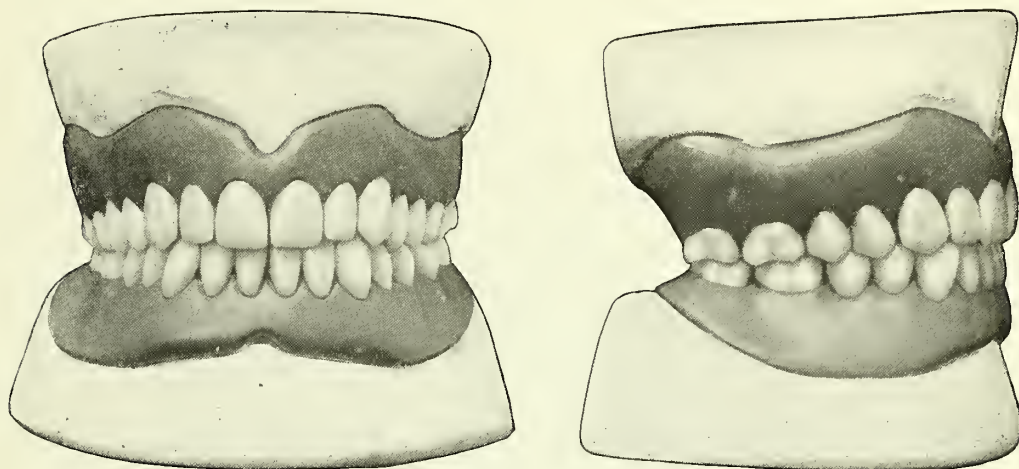


The Dentures illustrated above are distinctly typical of the temperaments described by SPURZHEIM, but it must be remembered that a pure type is seldom met with, the majority of cases being combinations of the features of more than one temperament.

INTRODUCTION.

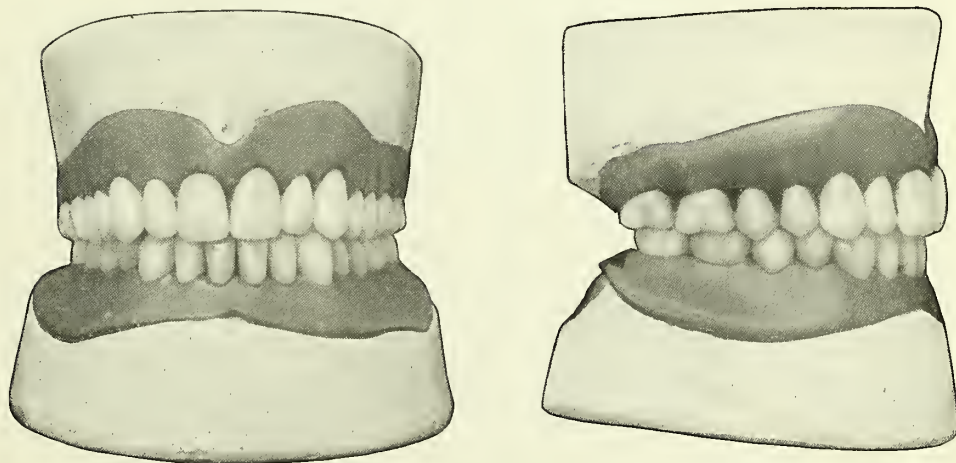
BILIOUS TYPE.

(TYPICAL SET No. 112, PAGE 52.)



NERVOUS TYPE.

(TYPICAL SET No. 139, PAGE 54.)



The Dentures illustrated above are distinctly typical of the temperaments described by SPURZHEIM, but it must be remembered that a pure type is seldom met with, the majority of cases being combinations of the features of more than one temperament.

INTRODUCTION.

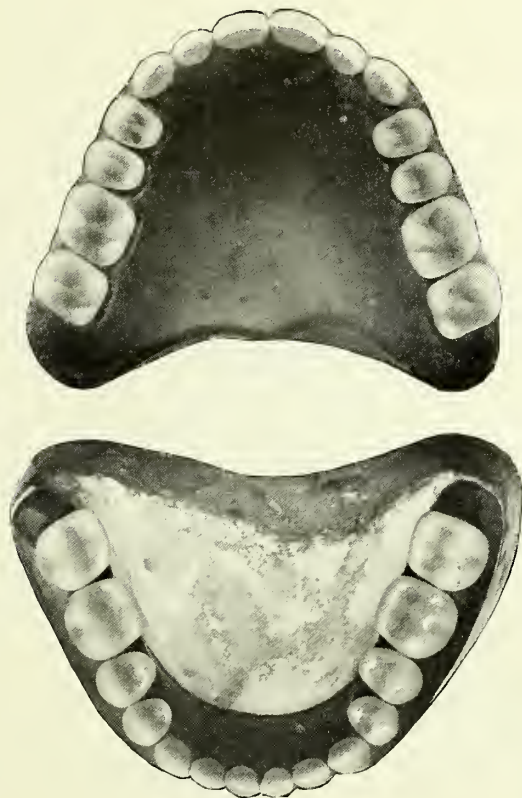
ASH'S
MINERAL TEETH.

With the extension of the study of anatomical articulation, there has arisen a demand for improved teeth, we therefore in 1907 added to our series of patterns certain moulds of Bicuspids and Molars, the proportions of which have been designed to meet the requirements of modern dental prosthesis.

They will be found to have proper correspondence between the cusps and fossæ of the upper and lower sets respectively, and they have good width in their bucco-lingual measurements.

The lingual cusps of the uppers are well developed, **but not to an extent which would cause locking during the lateral movement of the mandible.**

INTRODUCTION.

ASH'S
MINERAL TEETH.

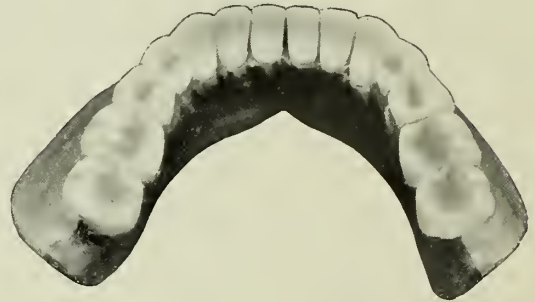
The above illustrations show the types of Bicuspids and Molars which lend themselves most easily to perfect articulation. In many cases they can be fitted as supplied, without the need for any grinding.

This is not a theoretical claim, but one which has been proved by experience.

These patterns are made in pin Teeth, see page 65, also in Diatoric, see pages 102 and 103.

INTRODUCTION.

ASH'S DOWEL CROWNS AND NON-PLATINUM TUBE TEETH.



These two classes of teeth mark a distinct advance in teeth for prosthetic work. In vulcanite dentures they yield the largest possible amount of room in the mouth, have a clean and pleasant feel to the tongue, are very lifelike in appearance, very natural in shape, and delightfully translucent. Further, they present open cleansing spaces, are sufficiently bulbous to give restorative fulness to the lips and cheeks, lend themselves to artistic irregularity in arrangement, possess unusual strength, offer great freedom of action in setting up, and are invaluable in repairs.

INTRODUCTION.

ASH'S TUBE TEETH.

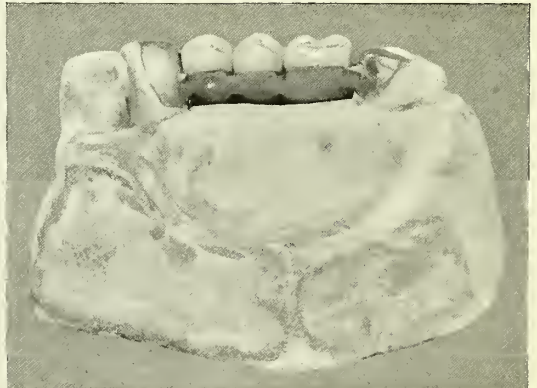
Introduced 75 years ago in 1837, these have been recognised as the strongest Artificial Teeth for several generations, and the fact that they have not been so generally used as pin teeth within the last 50 years is due on the one hand to the great development of vulcanite work, and on the other hand to the amount of labour which was involved in the grinding of the bases of tube teeth to fit them to the plates.

With the introduction of Casting, the necessity for much grinding and fine fitting of tube teeth has disappeared, and the revival of the use of these teeth has been welcomed by many practitioners who appreciate their strength and great adaptability.

The three accompanying illustrations indicate the use of Tube Teeth in Bridge Work.



Useful descriptions of work with Tube Teeth will be found in Dr. Chance's paper, "Tube Teeth in Æsthetic Crown and Bridge Work," and in Ash's pamphlet, "The use of all-porcelain Teeth in Vulcanite Dentures."



INTRODUCTION.

ASH'S MINERAL TEETH

Teeth are supplied in partial and complete sets as shown below.



Pair.



Set of 6.



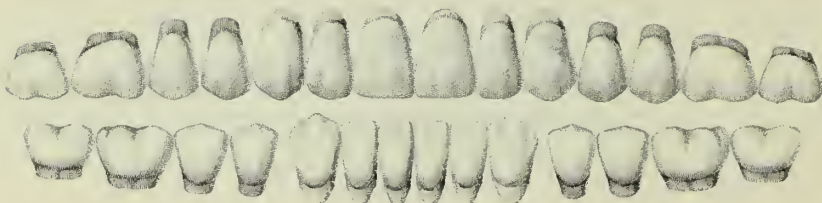
Set of 4 Incisors.



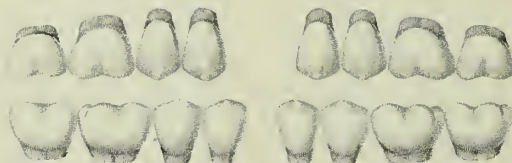
Set of 10.



Set of 14.



Set of 28.



Set of 16.



Set of 8.



Set of 4 Bicuspids.

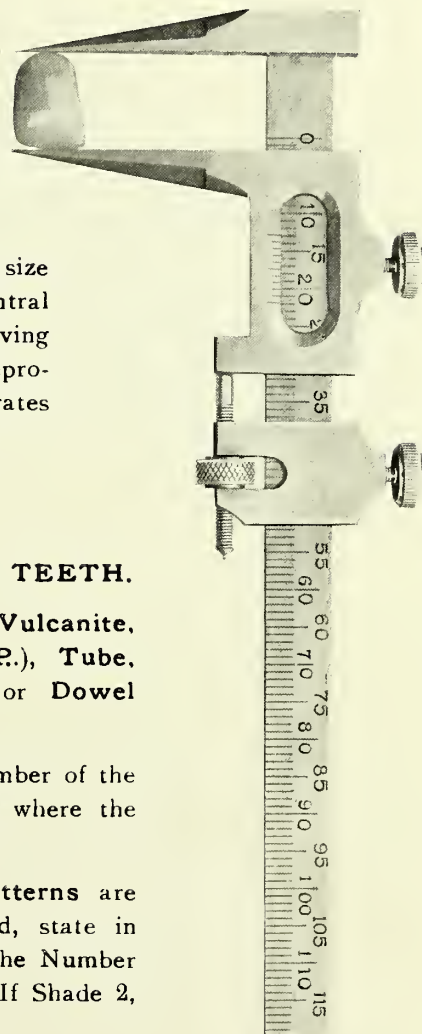
INTRODUCTION.

NOTES REGARDING THE ORDERING OF TEETH.

The engravings in this catalogue represent the actual length, width, thickness and shape of the teeth from which they are drawn. When there is any doubt as to which set of teeth is of the required length or width for a particular model, it is a simple matter to measure the space with the flexible millimetre strip and compare the measurement with the engravings of the pattern to be selected.



This photograph of the exact size of the micrometre with the right central of size 2—compared with the engraving of the right central of size 2 as reproduced from set 2, page 1, illustrates the exactitude of the engravings.



SUGGESTIONS FOR ORDERING TEETH.

For Kind.—State whether **Flat** or **Vulcanite**, **Long Pin (L.P.)** or **Headed Pin (H.P.)**, **Tube**, with or without **Platinum**, **Diatoric**, or **Dowel Crowns**, &c.

For Form and size.—State the number of the illustration, and the number of the page where the illustration is to be found.

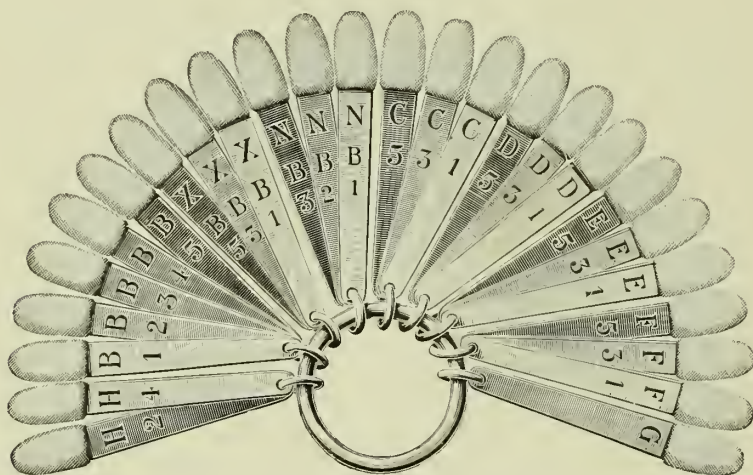
For Colour and Shade.—When patterns are not sent and our Set of Shades is used, state in the order the Letter for the **Colour**, and the Number for the **Shade** of that colour. Example: If Shade 2, of Colour B, is required write B/2.

INTRODUCTION.

ASH'S

SET OF TEETH SHADES.

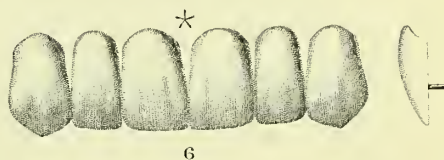
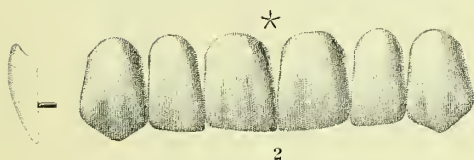
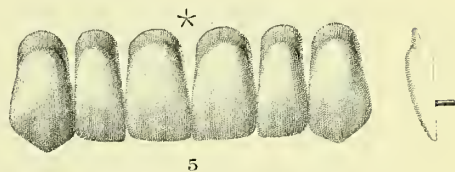
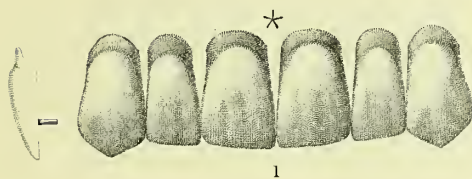
For the purpose of making the ordering of Teeth of various colours, and Shades, as easy as possible, we supply Sets of Shades of the colours most in demand. These sets of shades have, from long experience, been proved to be most useful when patterns of colours cannot be sent.



Each Tooth in the Set of Shades is made with a single pin, and is riveted to a strip of aluminium which is stamped, as shown above, to describe the colour and shade by which the Tooth is known—the letter indicates the colour and the number the shade.

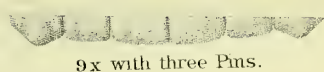
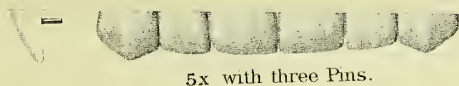
The single pin serves as a pivot, and permits of the Tooth being turned completely round, so that when the Upper Teeth are to be matched the cutting edge can be set downwards, as shown in the engraving, and inversely, when the Lowers are to be matched the cutting edge can be set upwards. This arrangement is of great advantage, inasmuch as it enables the operator to place any Tooth in the Set of Shades against the Teeth in the mouth in such a way that the effect is seen at a glance, and when he has found the Tooth which matches, it is only necessary for him to write for B/3, D/4, etc., in order to obtain the colour and shade which he requires.

ASH'S MINERAL TEETH, Flat Upper Sets.



Our Mineral Facings—see page 133—are made in all the forms which are marked with a star on pages 1-40.

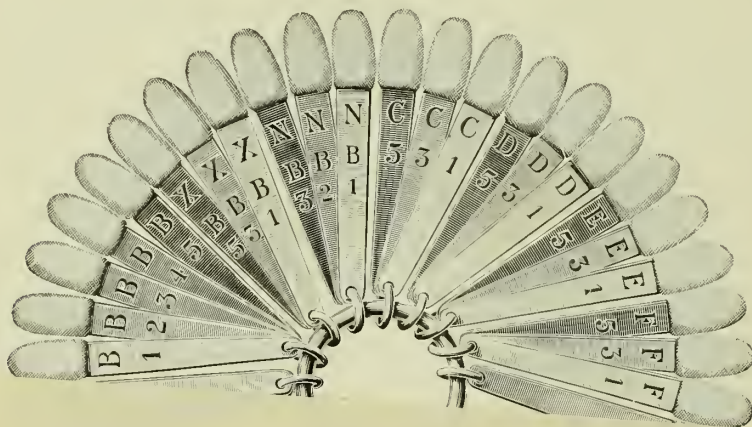
CLAUDIUS ASH, SONS & CO., Limited.



INTRODUCTION.

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SET OF TEETH SHADES.

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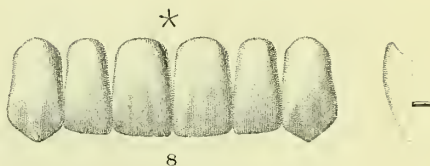
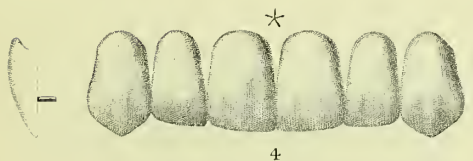
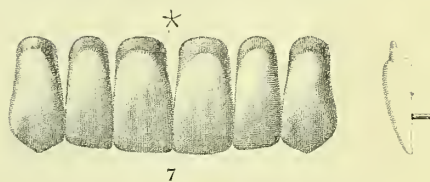
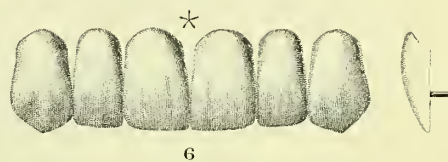
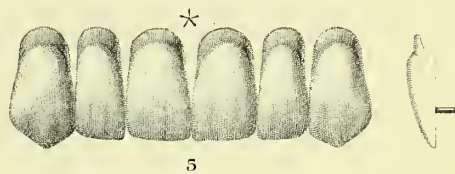


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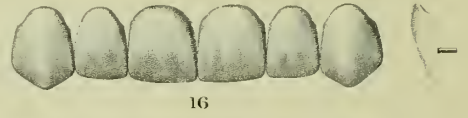
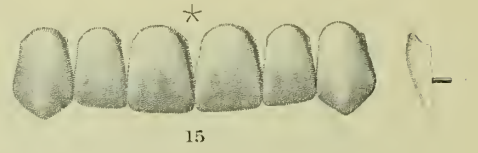
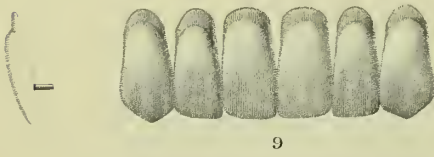
in the Set of Shades against the Teeth in the mouth.

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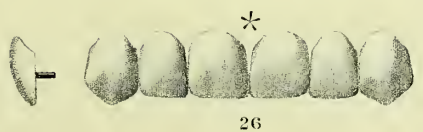
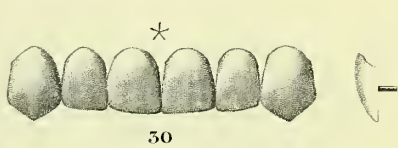
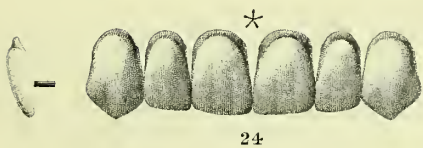
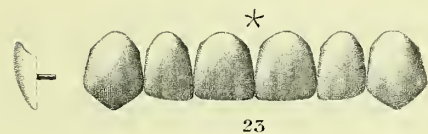
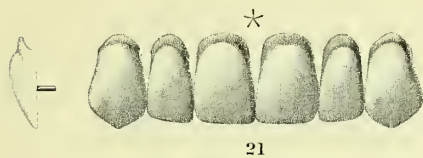
ASH'S MINERAL TEETH, Flat Upper Sets.



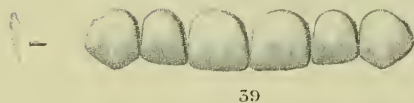
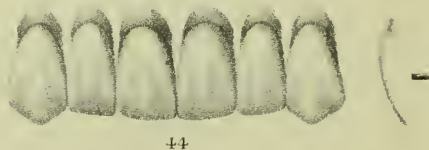
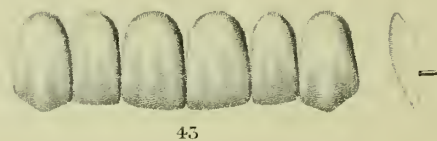
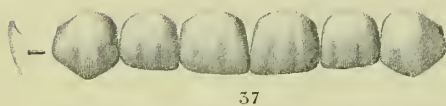
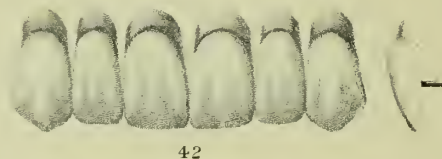
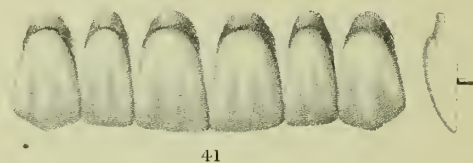
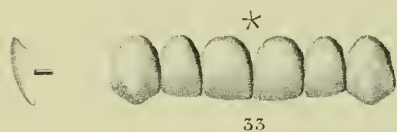
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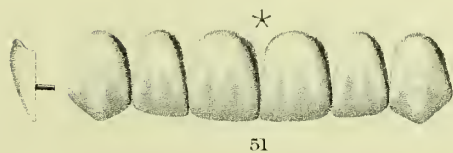
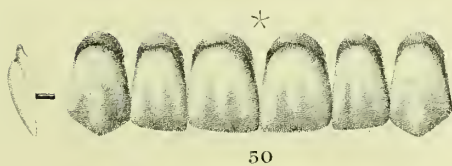
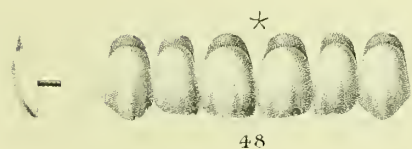
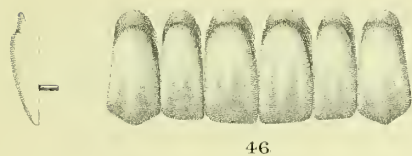
ASH'S MINERAL TEETH, Flat Upper Sets.



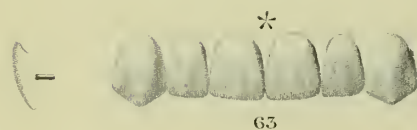
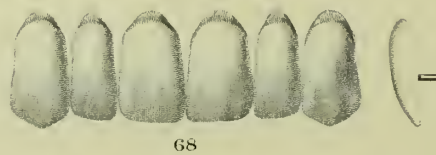
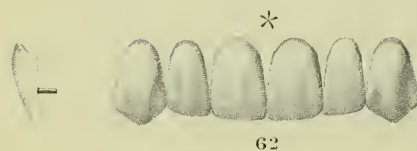
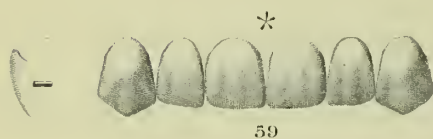
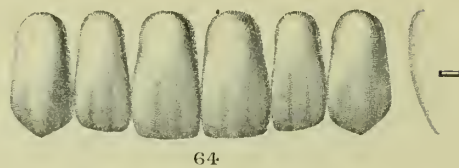
ASH'S MINERAL TEETH, Flat Upper Sets.



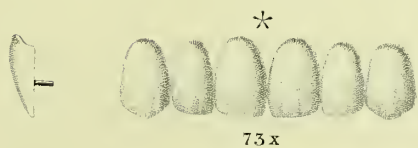
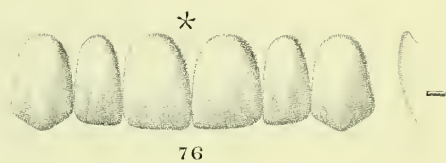
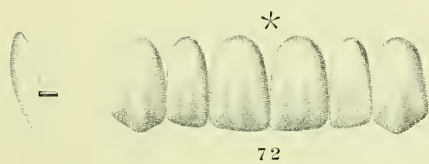
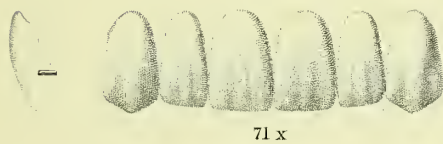
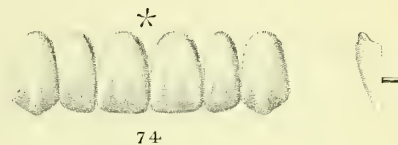
ASH'S MINERAL TEETH, Flat Upper Sets.



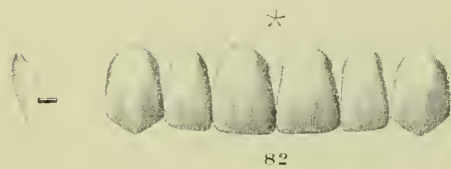
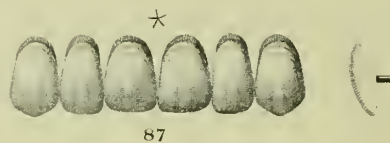
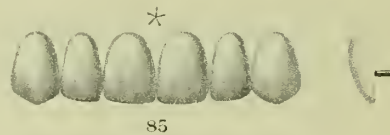
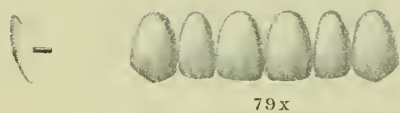
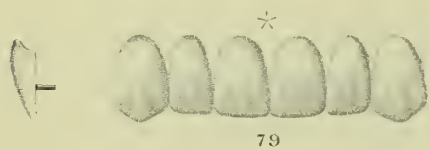
ASH'S MINERAL TEETH, Flat Upper Sets.



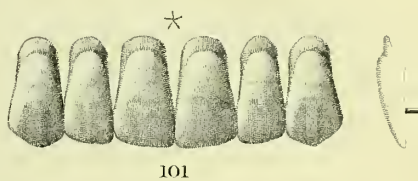
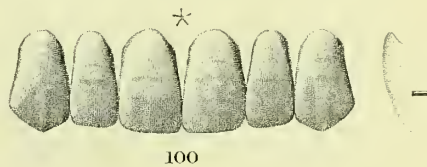
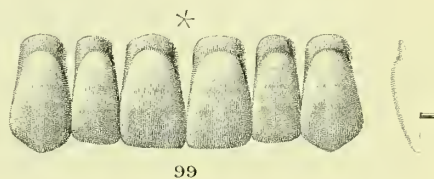
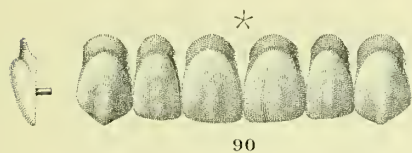
ASH'S MINERAL TEETH, Flat Upper Sets.



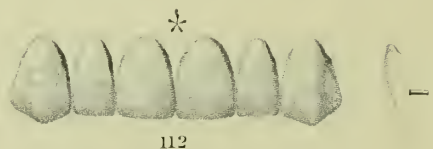
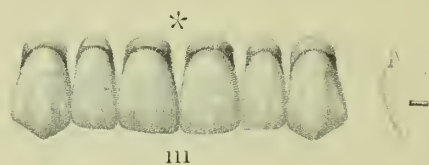
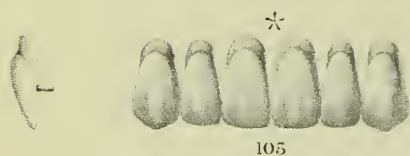
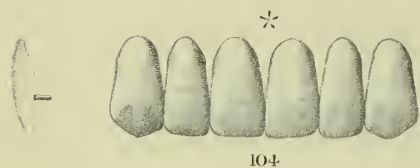
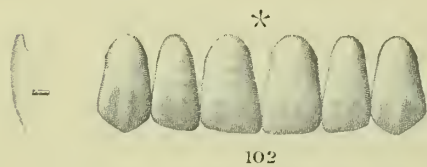
ASH'S MINERAL TEETH, Flat Upper Sets.



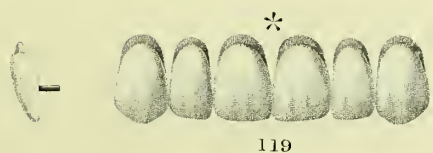
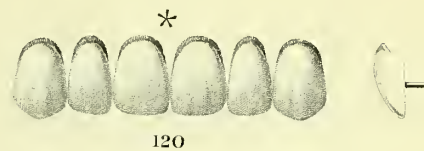
ASH'S MINERAL TEETH, Flat Upper Sets.



ASH'S MINERAL TEETH, Flat Upper Sets.



ASH'S MINERAL TEETH, Flat Upper Sets.



ASH'S MINERAL TEETH, Flat Upper Sets.



126



132



127



133x



128



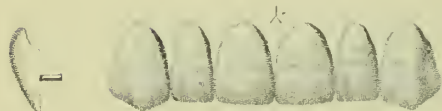
133



129



134



130



135

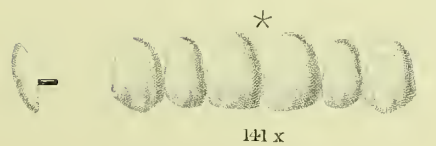


131

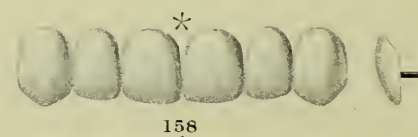
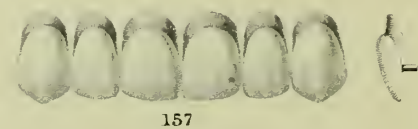
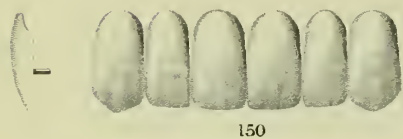
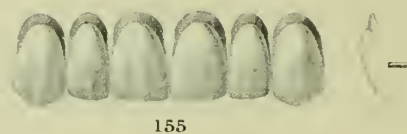
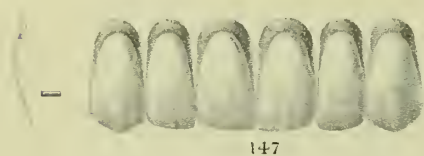


136

ASH'S MINERAL TEETH, Flat Upper Sets.



ASH'S MINERAL TEETH, Flat Upper Sets.



ASH'S MINERAL TEETH, Flat Upper Sets.



159



165



160



166



161



167



162



168



163

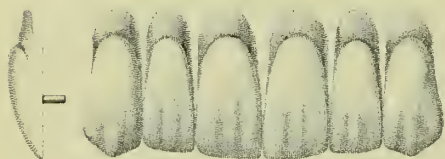


169



164

ASH'S MINERAL TEETH, Flat Upper Sets.



172



182



178



185



179



184



180



181

ASH'S MINERAL TEETH, Flat Upper Sets.



55
Bevelled edge.



82
Bevelled edge.



54
Bevelled edge.



85
Bevelled edge.



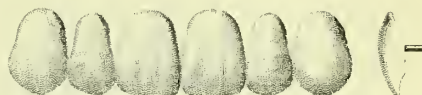
57
Bevelled edge.



135
Bevelled edge.



58
Bevelled edge.



136
Bevelled edge.



81
Bevelled edge.



137
Bevelled edge.



138
Bevelled edge.

ASH'S MINERAL TEETH, Flat Upper Sets.



3
High Pins.



22
High Pins



4
High Pins.



24
High Pins.



7
High Pins.



27
High Pins.



8
High Pins.



28
High Pins.



20
High Pins



29
High Pins.



21
High Pins



31
High Pins.

ASH'S MINERAL TEETH, Flat Upper Sets.



52
High Pins.



60
High Pins.



53
High Pins.



61
High Pins.



54
High Pins.



62
High Pins.



56
High Pins.



397



57
High Pins.



398



58
High Pins.



399

THREE PAIRS, CENTRALS.

ASH'S MINERAL TEETH, Flat Upper Sets.



15
Granulated.



18
Granulated.



26
Granulated.



29
Granulated.



55
Granulated.



58
Granulated.



63
Granulated.



70
Granulated.



72
Granulated.



75
Granulated.



74
Granulated.



76
Granulated.



77
Granulated.



78
Granulated.



79
Granulated.

ASH'S MINERAL TEETH, Flat Lower Sets.



0



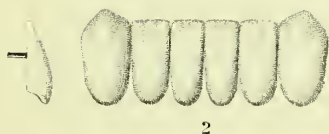
6



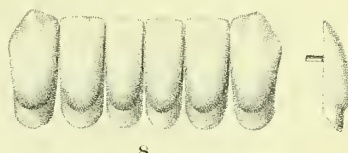
1



7



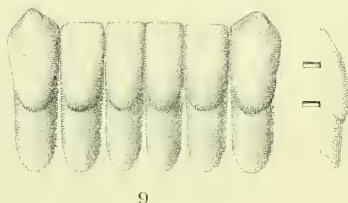
2



8



3



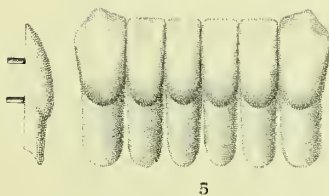
9



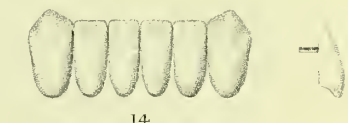
4



13



5



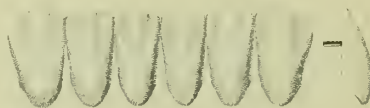
14

The centrals in sets 0 and 1 and the centrals and laterals in sets 13 and 14 have vertical pins as shown in section against 5 and 9.

ASH'S MINERAL TEETH, Flat Lower Sets.



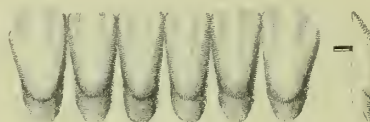
16



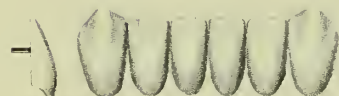
26



17



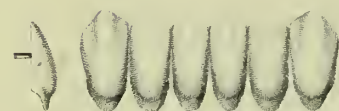
27



19



30



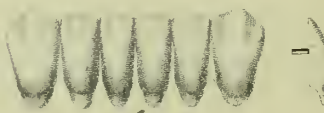
20



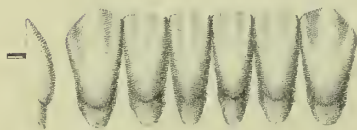
31



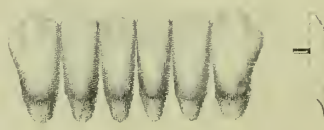
22



32



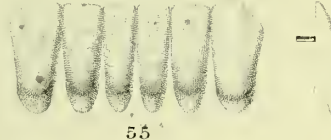
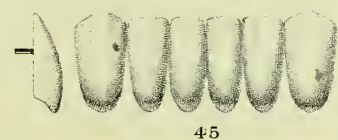
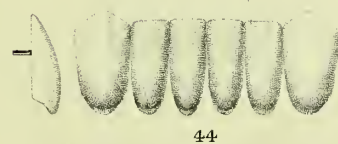
23



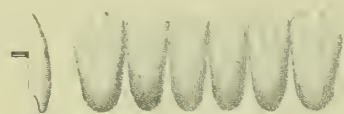
33

The centrals in sets 16, 17, 31, 32, 33, have vertical pins
like section against 5 on page 21.

ASH'S MINERAL TEETH, Flat Lower Sets.



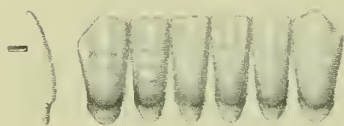
ASH'S MINERAL TEETH, Flat Lower Sets.



56



72



57



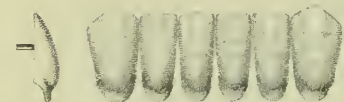
73



59



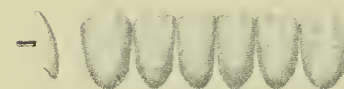
76



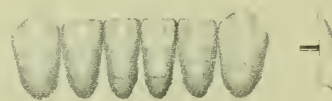
60



77



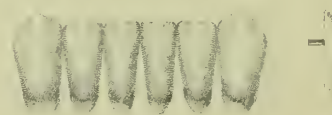
61



78



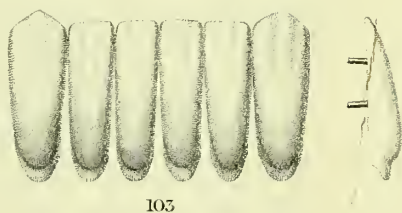
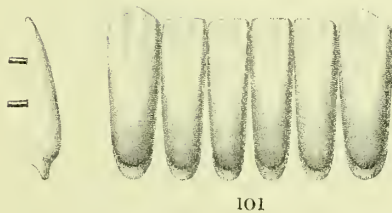
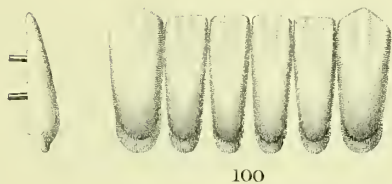
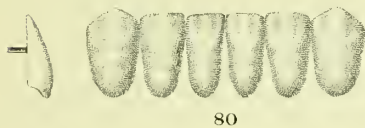
62



79

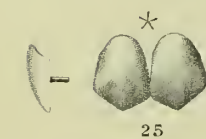
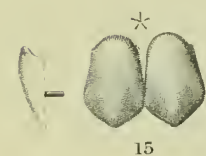
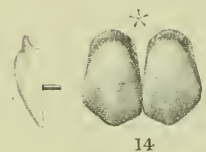
The centrals in sets 72, 73, 78, 79, have vertical pins like the sections against 5 Page 21.

ASH'S MINERAL TEETH, Flat Lower Sets.



The centrals of sets 80 and 81 have vertical pins, as shown in section against 100.

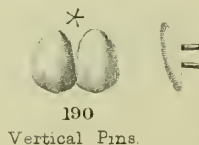
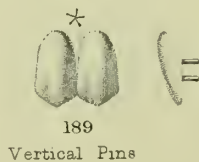
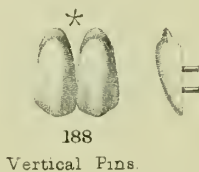
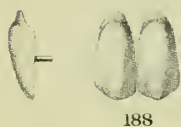
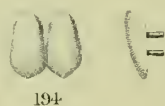
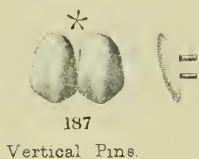
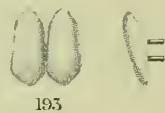
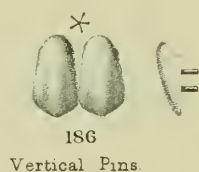
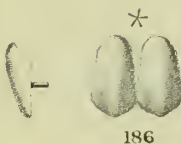
ASH'S MINERAL TEETH, Flat Upper Pairs of Canines.



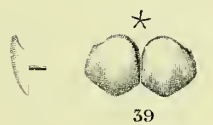
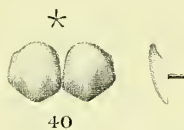
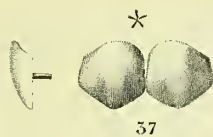
ASH'S MINERAL TEETH, Flat Upper Pairs of Canines.



ASH'S MINERAL TEETH, Flat Pairs of Canines.



ASH'S MINERAL TEETH, Flat Pairs of Canines.



ASH'S MINERAL TEETH, Flat Bicuspids.

FOR PLATE WORK.

UPPERS.

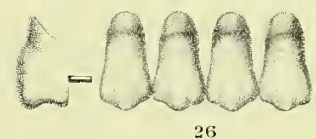
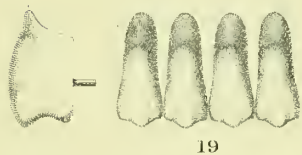


Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Bicuspid.

FOR PLATE WORK.

UPPERS.



Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Bicuspids.

FOR PLATE WORK
(LOWERS).



110



127



111



131



119



132



120



176



125



190



126



191

Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Bicuspids.

UPPERS.

WITH BEVELLED CUTTING EDGES.



100



101



102



103



104

LOWERS.

WITH BEVELLED CUTTING EDGES.



177



178



179



180

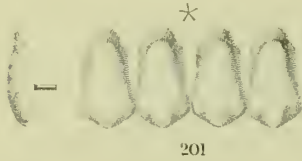


181

Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Bicuspids.

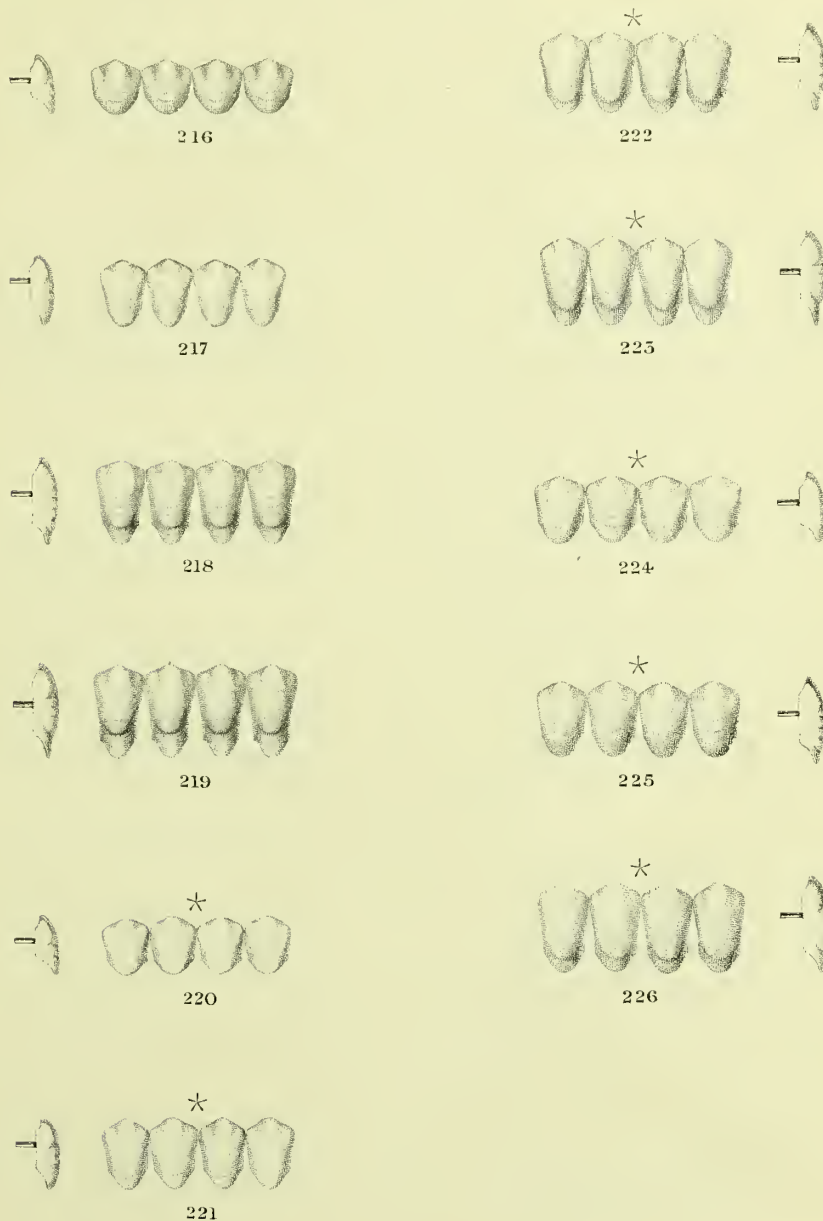
UPPERS—VENEERS.



Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Bicuspids.

LOWERS—VENEERS.



Supplied in sets of four, and with Molars in sets of eight.

ASH'S MINERAL TEETH, Flat Molars.

FOR PLATE WORK.

UPPERS.

LOWERS.



11



77



12



78



13



80



14



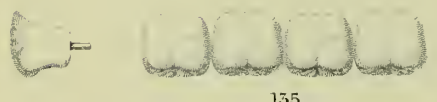
81



134



144



135

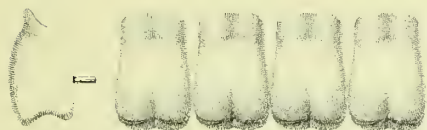


145

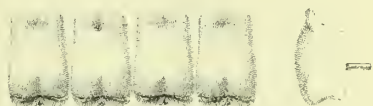
Supplied in sets of four, and with Bicusps in sets of eight.

ASH'S MINERAL TEETH, Flat Molars.

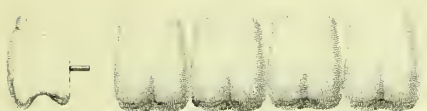
FOR PLATE WORK.



55



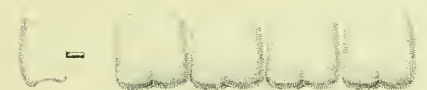
59



56



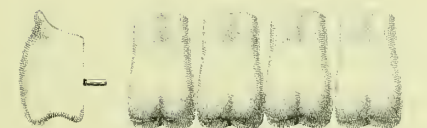
60



54



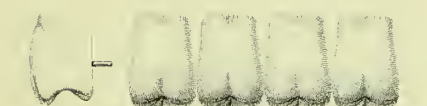
61



57



62



58

Supplied in sets of four, and with Bicuspids in sets of eight.

ASH'S MINERAL TEETH, Flat Molars.

UPPERS.

WITH BEVELLED CUTTING EDGES.



130



131



132



135

LOWERS.

WITH BEVELLED CUTTING EDGES.



140



141



142



145

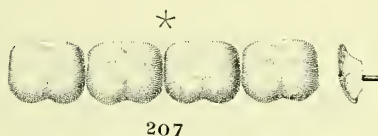
Supplied in sets of four, and with Bicuspids in sets of eight.

ASH'S MINERAL TEETH, Flat Molars.

UPPERS—VENEERS.



201



207



202



208



203



209



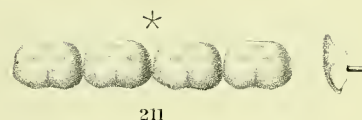
204



210



205



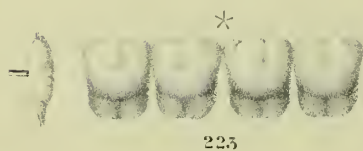
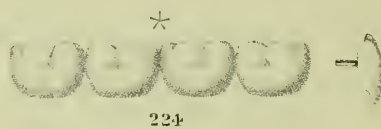
211



206

Supplied in sets of four, and with Bicuspids in sets of eight.

ASH'S MINERAL TEETH, Flat Molars.

LOWERS—VENEERS.

Supplied in sets of four, and with Bicuspids in sets of eight.

ASH'S MINERAL TEETH.

VULCANITE COMPLETE SETS OF TEETH.

Sets of 28 are supplied as follows:

(a) All Vulcanite Teeth.

(b) Flat Upper 6 Anterior Teeth, remainder Vulcanite.

Unless Flat Uppers are specified, the complete set will be supplied in Vulcanite Teeth.

To order sets of 28 it is only necessary to state the number which indicates the pattern and size of the set of six Upper Teeth required (see pages 46 to 54). The Bicuspid and Molars are matched to the Front Teeth in proper proportion to their length and width.

In illustrating a few complete sets on pages 42 and 43 we would draw attention to the fact that the question of articulation has been carefully studied, with a view to reducing the necessary work of grinding and fitting to a minimum.

Vulcanite Teeth of all sizes and patterns are supplied with Long pins,

thus

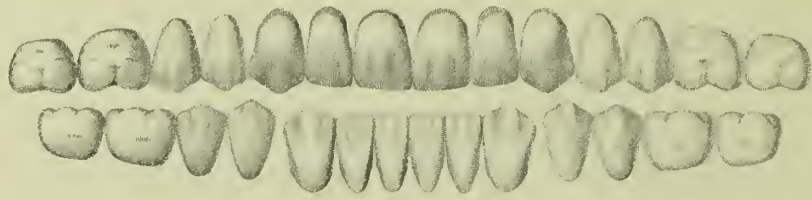


=

or with Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite.



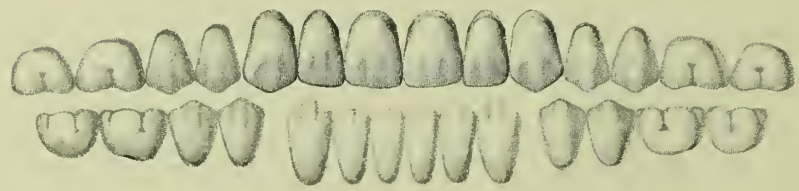
58



63

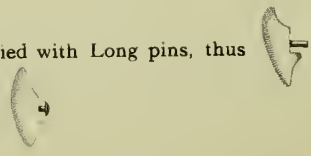


73



83

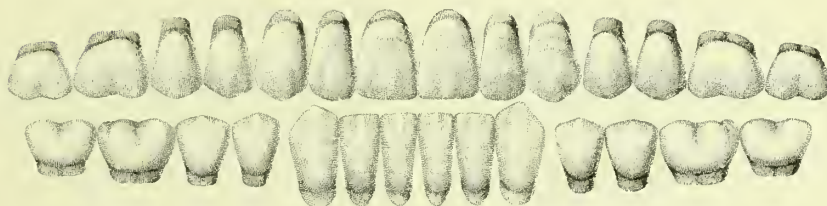
Sets of 28 of all sizes and patterns are supplied with Long pins, thus
or with Headed pins, thus



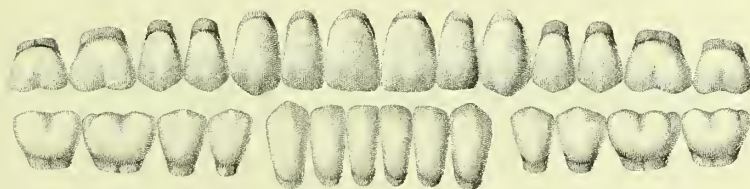
ASH'S MINERAL TEETH, Vulcanite.



92



139



141

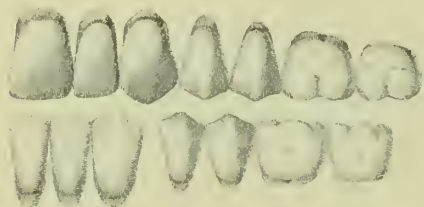


176

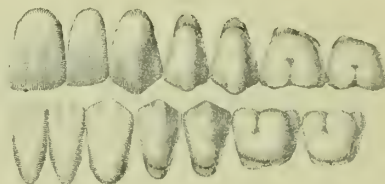
Sets of 28 of all sizes and patterns are supplied with Long pins, thus
 or with Headed pins, thus



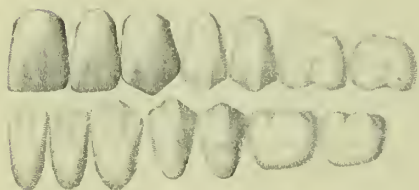
ASH'S MINERAL TEETH, Vulcanite.



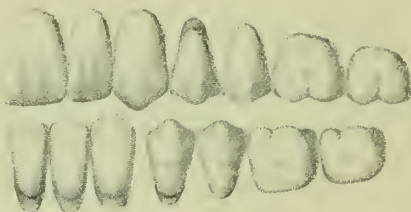
21



62



22



71



29



78



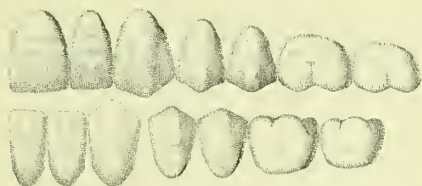
57



79

Sets of 28 of all sizes and patterns are supplied with Long pins, thus
or with Headed pins, thus

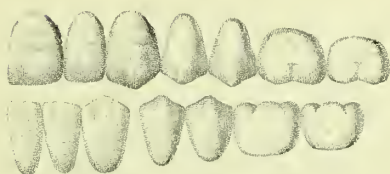
ASH'S MINERAL TEETH, Vulcanite.



112



158



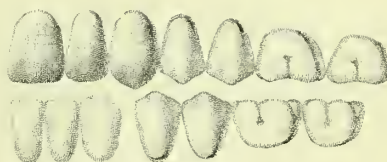
115



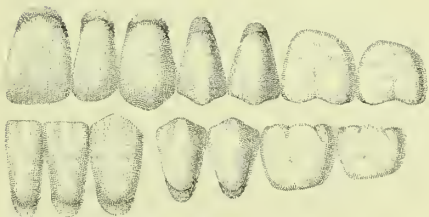
140



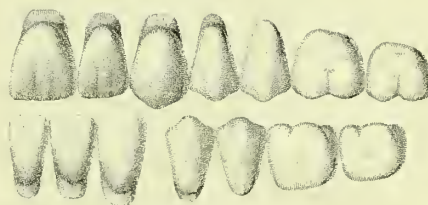
154



142



155



175

Sets of 28 of all sizes and patterns are supplied with Long pins, thus

or with Headed pins, thus



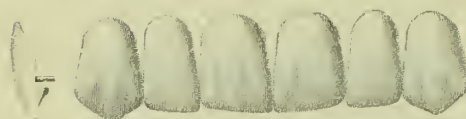
ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



1



7



2



8



3



9



4



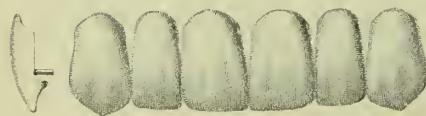
10



5



14



6



15

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



17



24



18



25



19



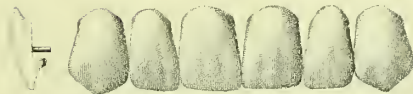
26



21



28



22



29



23



30

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



31



45



32



46



33



47



42



50



43



51



44



53

All the above patterns and sizes are also supplied with

Headed pins, thus

ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



54



62



55



63



57



68



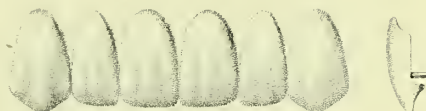
58



69



59



70



61



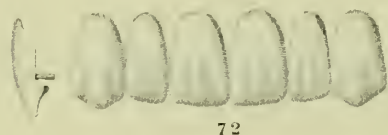
71

All the above patterns and sizes are also supplied with

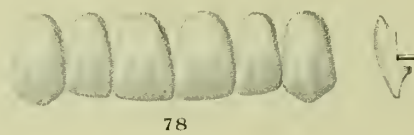
Headed pins, thus



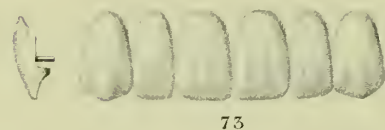
ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



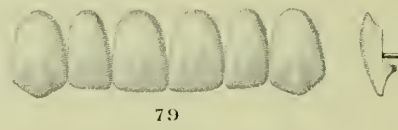
72



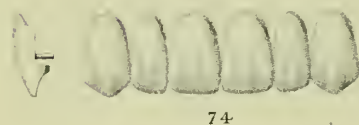
78



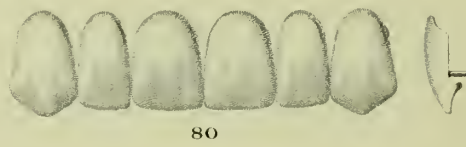
73



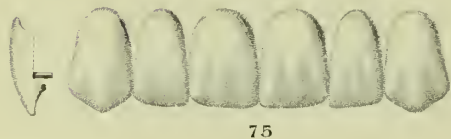
79



74



80



75



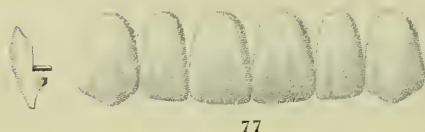
81



76



82



77



83

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



84



95



90



99



91



100



92



101



93



102



94



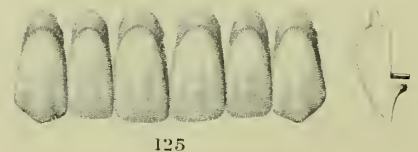
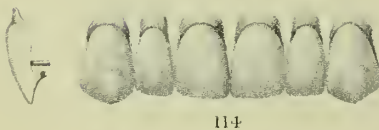
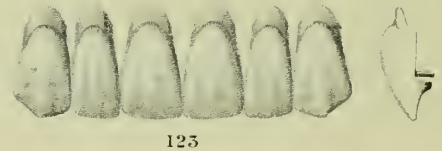
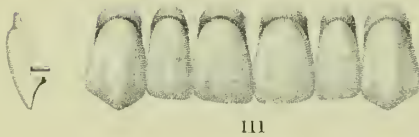
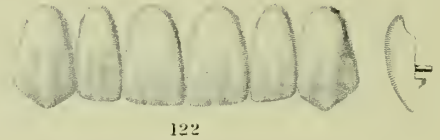
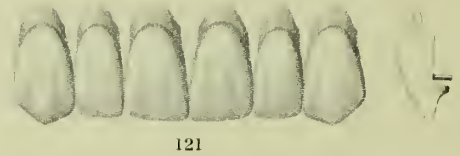
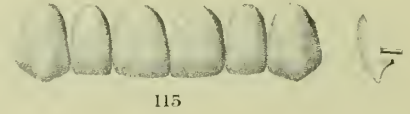
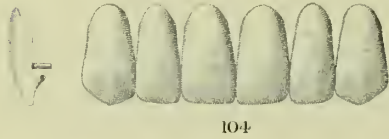
103

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



All the above patterns and sizes are also supplied with
Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



126



132



127



133



128



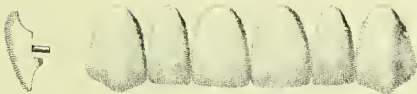
134



129



135



130



136



131



137

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Upper Sets.



138



144



139



173



140



174



141



175



142



176



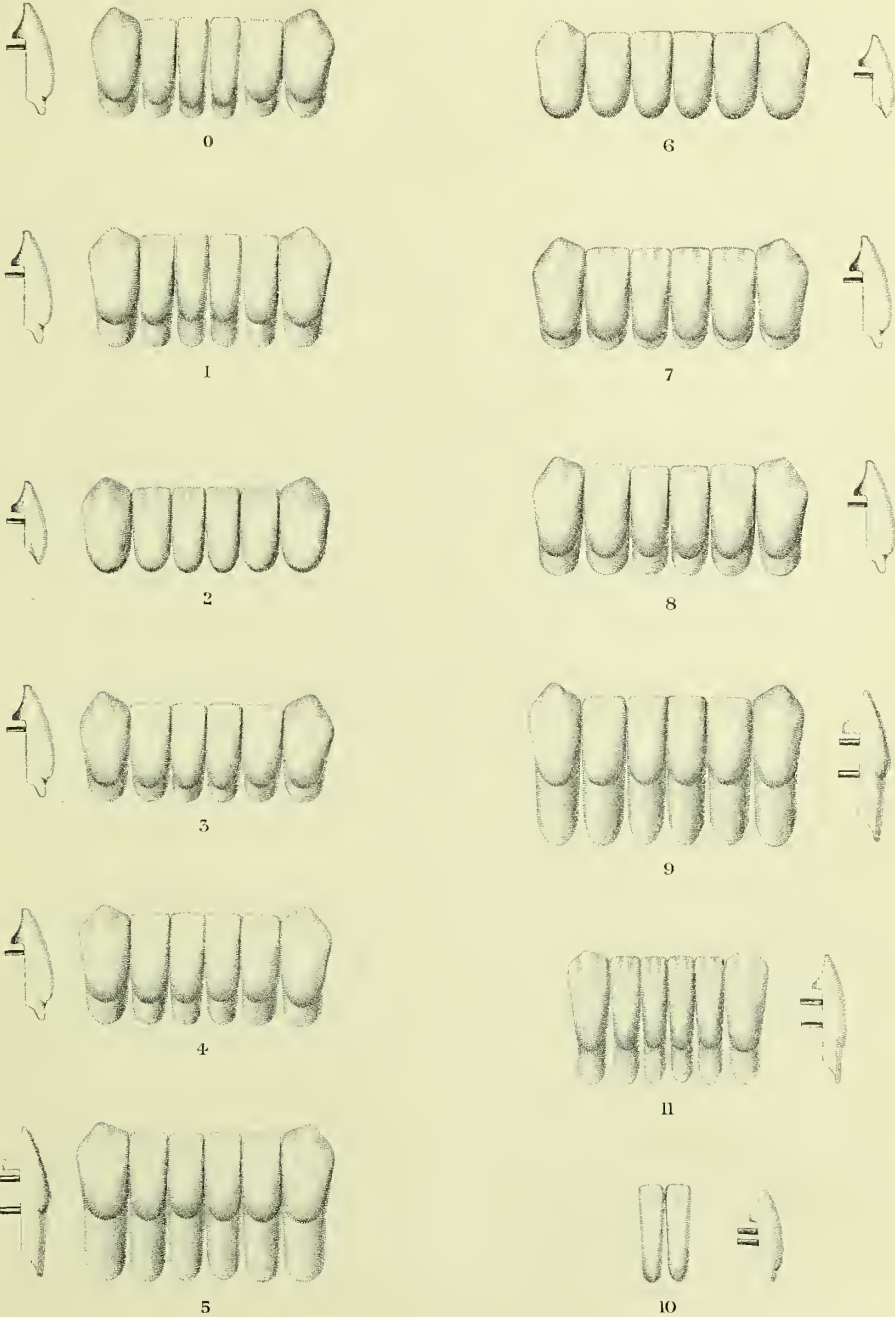
143



All the above patterns and sizes are also supplied with

Headed pins, thus



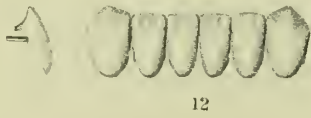
ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



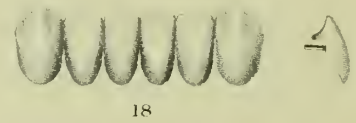
All the above patterns and sizes are also supplied with Headed pins, thus  or 

The centrals in sets 0 and 1 have vertical pins as shown in section against 11.

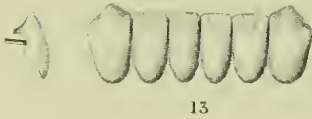
ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



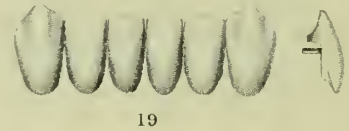
12



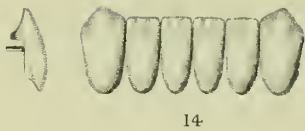
18



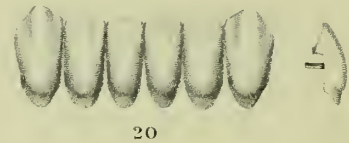
13



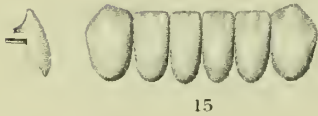
19



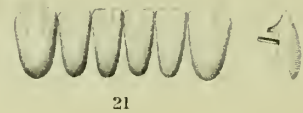
14



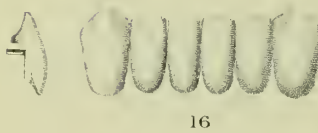
20



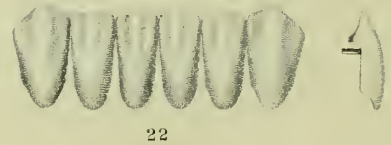
15



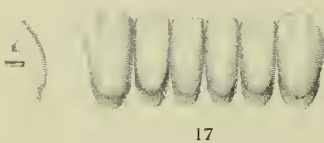
21



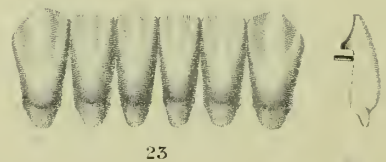
16





22



17

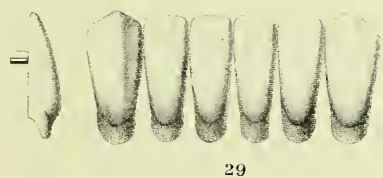
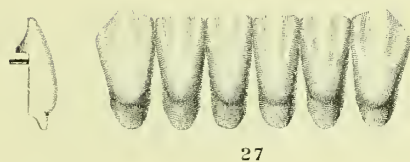
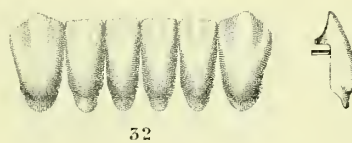
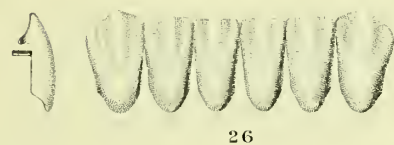
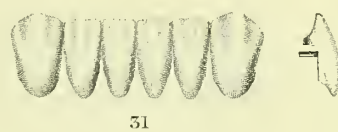


23

All the above patterns and sizes are also supplied with Headed pins, thus  or 

The centrals and laterals in sets 12, 13, 14, 21, and the centrals of 15, 16, 17, have vertical pins, as shown against 73x, Page 61.

ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



All the above patterns and sizes are also supplied with Headed pins, thus

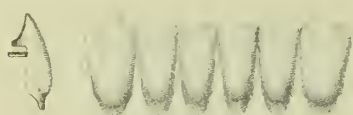


or

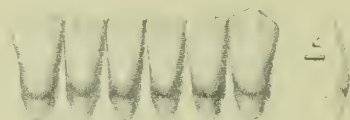


The centrals of 31, 32, 33, 34, have vertical pins, as shown against 73^x, Page 61.

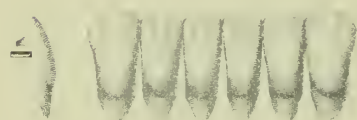
ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



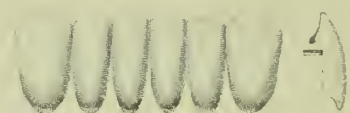
37



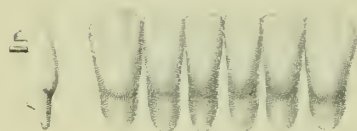
43



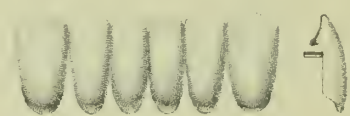
38



44



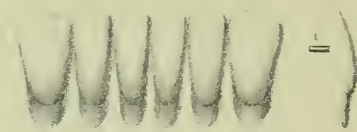
39



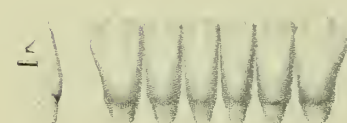
45



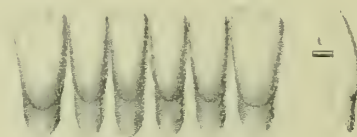
40



46



41



47



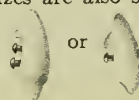
42



48X

All the above patterns and sizes are also supplied with

Headed pins, thus

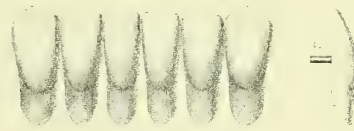


or

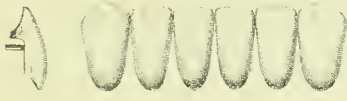
ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



48



52



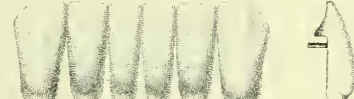
49



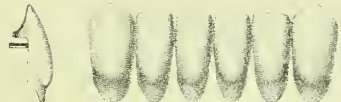
54



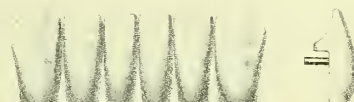
50x



55



50



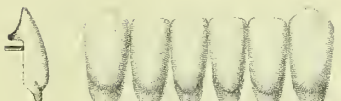
53



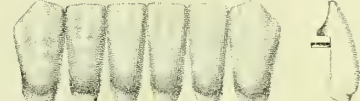
51x



56



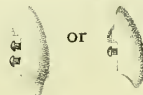
51



57

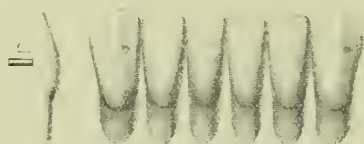
All the above patterns and sizes are also supplied with

Headed pins, thus

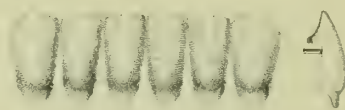


or

ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



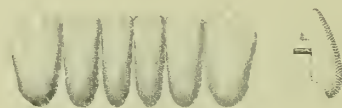
58



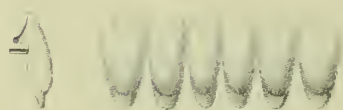
62



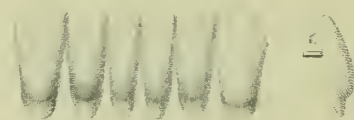
59x



63



60x



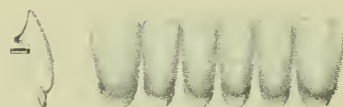
64



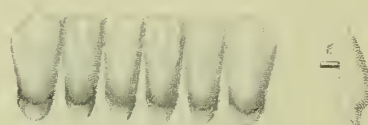
59



65



60



66



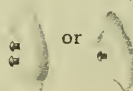
61



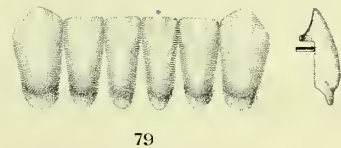
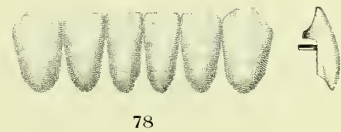
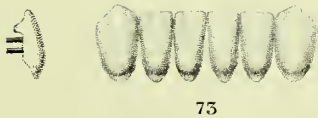
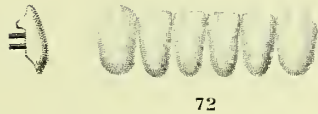
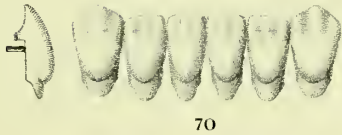
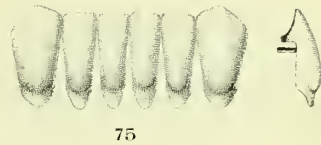
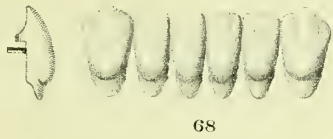
67

All the above patterns and sizes are also supplied with

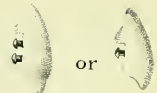
Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Lower Sets.

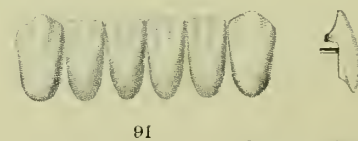
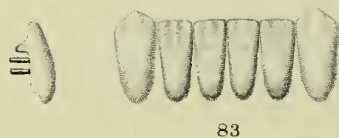
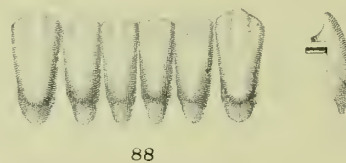
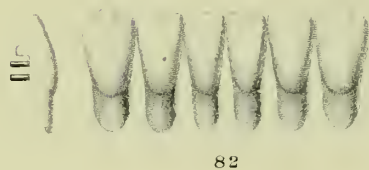
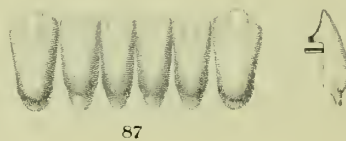
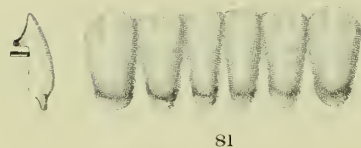
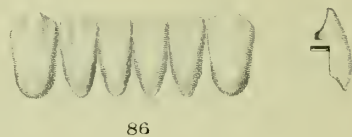
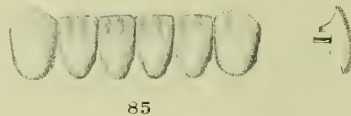
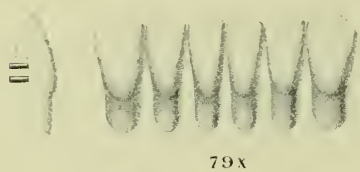


All the above patterns and sizes are also supplied with Headed pins, thus

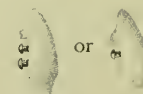


The centrals and laterals of 74, 75, and the centrals of 78, 79, have vertical pins, as shown against 73^x.

ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



All the above patterns and sizes are also supplied with Headed pins, thus



or



The centrals of 80, 81, 86, 87, 88, have vertical pins, as shown against 82.

ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



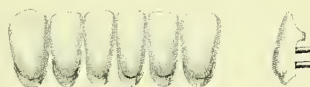
92



104



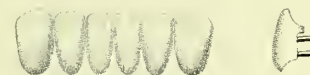
95



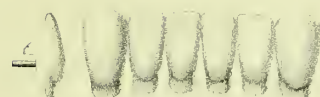
105



94



106



95



107



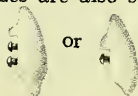
96



109

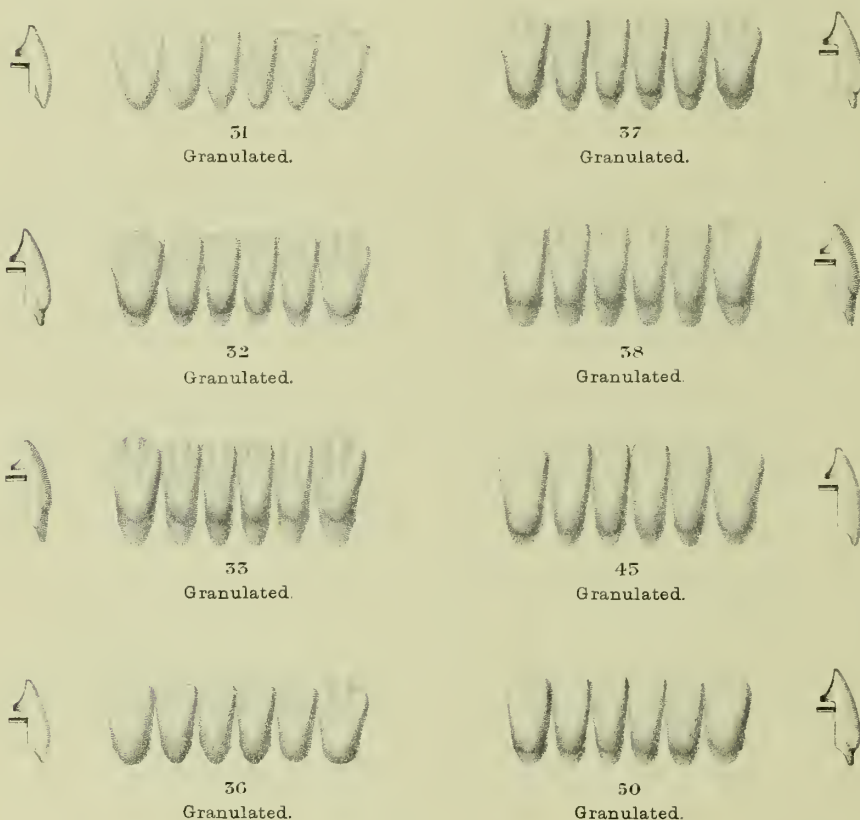
All the above patterns and sizes are also supplied with

Headed pins, thus



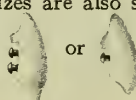
or

ASH'S MINERAL TEETH, Vulcanite. Lower Sets.



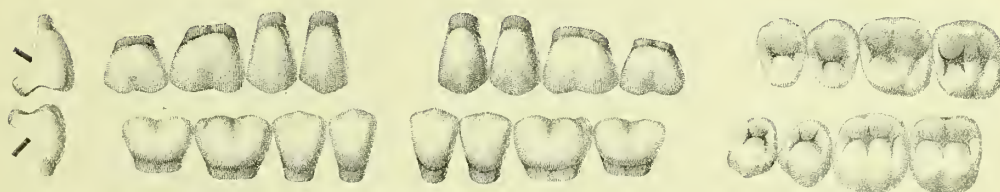
All the above patterns and sizes are also supplied with

Headed pins, thus

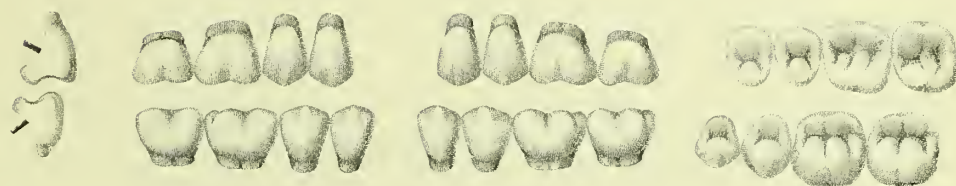


ASH'S MINERAL TEETH, Vulcanite.

ARTICULATED BICUSPIDS AND MOLARS.



228



250

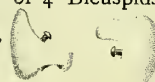


285

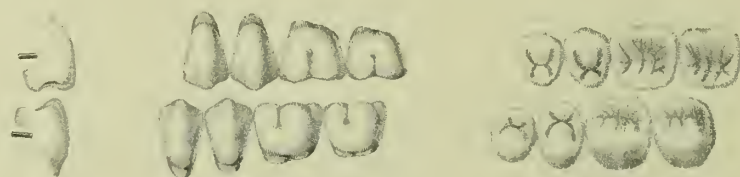


287

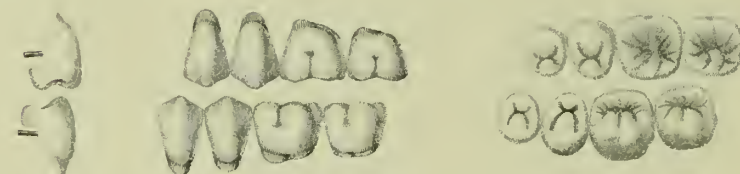
The above illustrations represent sets of 16, but all patterns and sizes are also supplied in sets of eight Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower, also with Headed pins, thus,



ASH'S MINERAL TEETH, Vulcanite. Bicuspid and Molars.



262 TK.



262 TN.



263 TK.



263 TN



265

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower, also with Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid and Molars.



267 TK.



267 TN.



268 TK.



268 TN.



279

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower, also with Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid and Molars.



280



281



282



283



284

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower, also with Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid and Molars.



285



286



287



288TK.



288IN.

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower, also with Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding lower Bicuspid and Molars in sets of 16.



1



7



2



8



3



11



4



12



5



13



6



14

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8, and with corresponding lower Bicuspid and Molars in sets of 16, excepting 15, 17, 19.



15



22



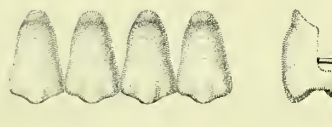
16



23



17



24



18



25



19



26



20



27

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding lower Bicuspid and Molars in sets of 16.



29



35



30



36



31



37



32



37x



33



38



34



39

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding lower Bicuspid and Molars in sets of 16.



65



105



66



106



67



107



68



108



69

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding upper Bicuspid and Molars in sets of 16.



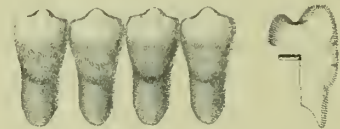
110



117



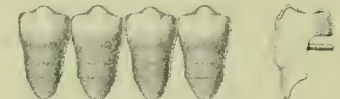
111



118



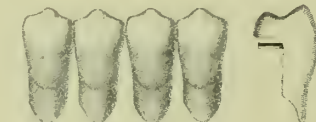
112



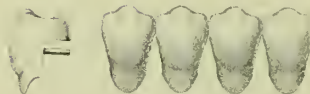
119



113



120



114



121




115



122

All the above patterns and sizes are also supplied with

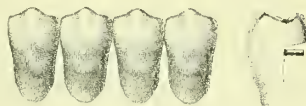
Headed pins, thus 

ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding upper Bicuspids and Molars in sets of 16.



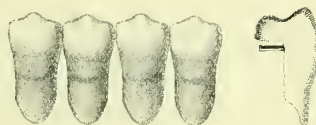
123



131



124



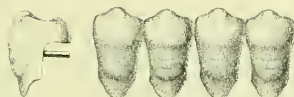
132



125



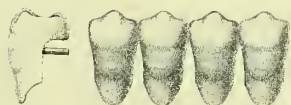
152



126



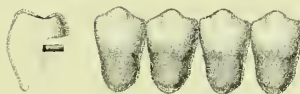
153



127



154




130



155

All the above patterns and sizes are also supplied with

Headed pins, thus 

ASH'S MINERAL TEETH, Vulcanite. **Bicuspid.**

All these sizes are also supplied with Molars in sets of 8 and with corresponding upper Bicuspid and Molars in sets of 16.



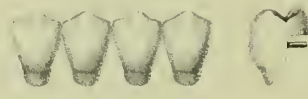
156



184



157



185



158



186



187

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8, and with corresponding lower Bicuspid and Molars in sets of 16, excepting 61, 64.



53



59



54



60



55



61



56



63



57



64



58

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8, and with corresponding lower Bicuspid and Molars in sets of 16, excepting 48, 49.



40



46



41



48



42



49



43



50



44



51



45



52

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8 and with corresponding upper Bicuspid and Molars in sets of 16.



133



139



134



140



135



141



136



142



137



143



138



144

All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Bicuspid.

All these sizes are also supplied with Molars in sets of 8, and with corresponding upper Bicuspid and Molars in sets of 16, excepting 149.



145



151



146



182



147



185



148



188



149



150

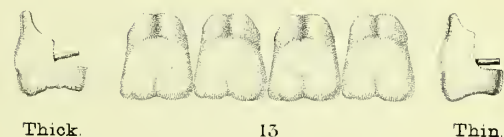
All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. **Molars.**

All these sizes are also supplied with Bicuspids in sets of 8, and with corresponding lower Bicuspids and Molars in sets of 16.



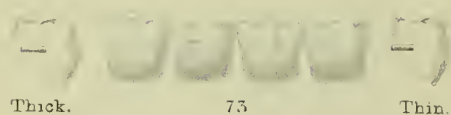
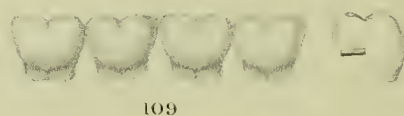
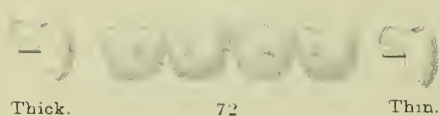
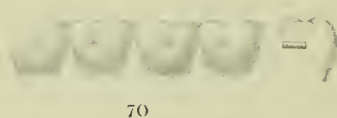
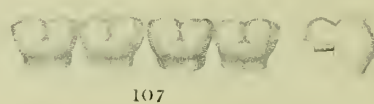
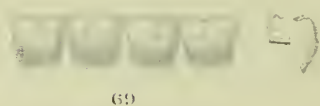
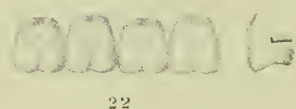
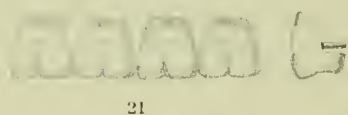
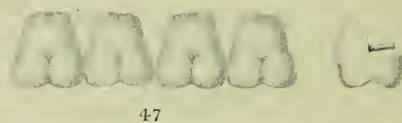
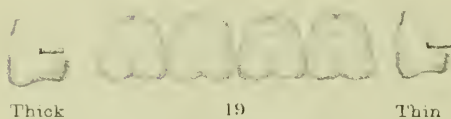
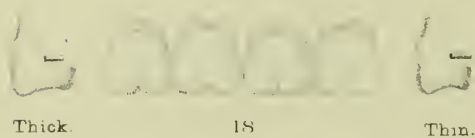
All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Molars.

All these sizes are also supplied with Bicuspid in sets of 8, and with corresponding upper and lower Bicuspid and Molars in sets of 16.



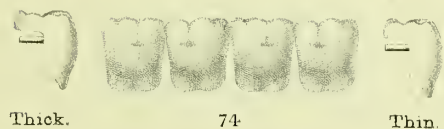
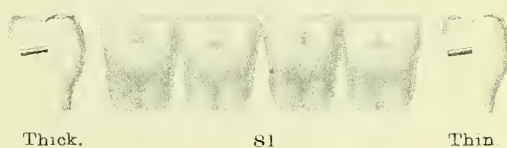
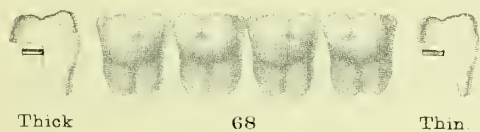
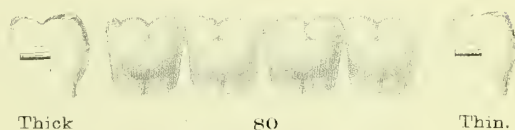
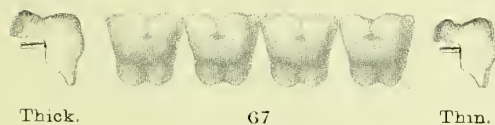
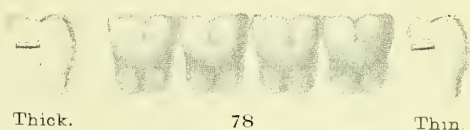
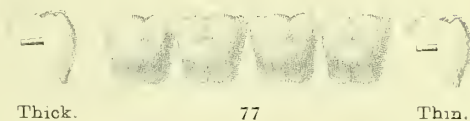
All the above patterns and sizes are also supplied with

Headed pins, thus




ASH'S MINERAL TEETH, Vulcanite. Molars.

All these sizes are also supplied with Bicuspid in sets of 8, and with corresponding upper Bicuspid and Molars in sets of 16.

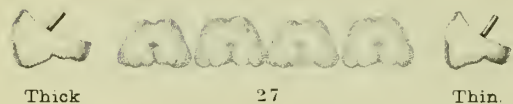
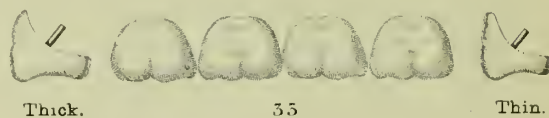
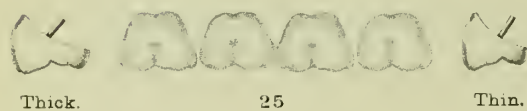
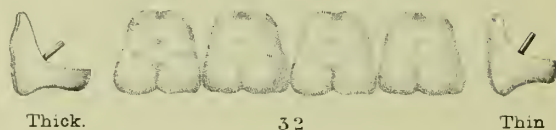
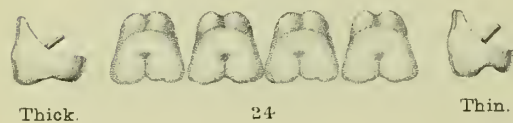


All the above patterns and sizes are also supplied with

Headed pins, thus 

ASH'S MINERAL TEETH, Vulcanite. Molars.

All these sizes are also supplied with Bicuspid in sets of 8, and with corresponding lower Bicuspid and Molars in sets of 16, excepting 32, 33.



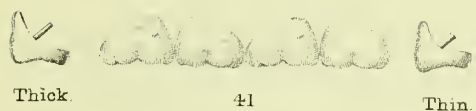
All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Molars.

All these sizes are also supplied with Bicuspid in sets of 8, and with corresponding upper and lower Bicuspid and Molars in sets of 16.



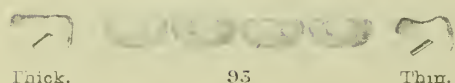
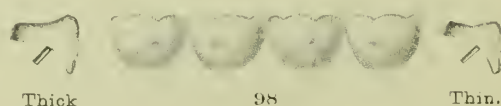
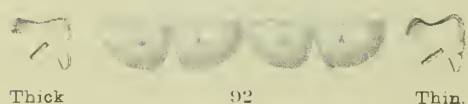
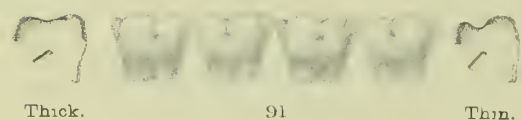
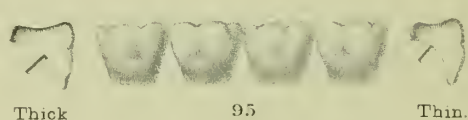
All the above patterns and sizes are also supplied with

Headed pins, thus



ASH'S MINERAL TEETH, Vulcanite. Molars.

All these sizes are also supplied with Bicuspids in sets of 8, and with corresponding upper Bicuspids and Molars in sets of 16.

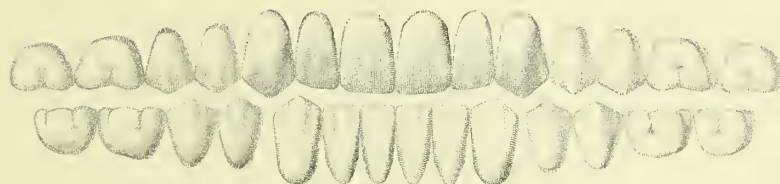


All the above patterns and sizes are also supplied with

Headed pins, thus



COMBINATION SETS.



62



139

Combination Sets are composed of Anterior Pin Teeth, with Diastoric Bicuspid and Molars. They are supplied with Flat Upper Teeth and Vulcanite Lowers, or Long Pin Vulcanite Uppers and Lowers, also with Headed Pin Uppers and Lowers.

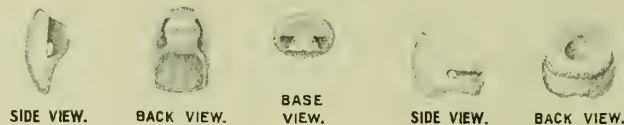
In illustrating these sets of 28, we would draw attention to the fact that the question of articulation is carefully studied, with a view to reducing the work of grinding and fitting to a minimum. The Bicuspid and Molars are matched to the Front Teeth in proper proportion to length and width.

Combination Sets of 28 are supplied in all the sizes in which the sets of 6 are made, the sets on this page being only samples of what we supply.

ASH'S DIATORIC TEETH.

Our Diatoric Teeth are made of the same mineral as our Pin Teeth, and possess the same qualities of strength and freedom from porosity. They are made in a great variety of shapes, sizes and shades, and are well adapted for Vulcanite work.

They have now been before the Profession for more than forty years, and the increasing demand for them in all parts of the world is good evidence of their high quality.



The above illustrations of a Diatoric Incisor, viewed from the side, from the back, from the base, and of a Molar, viewed from the side and from the back, show the features which go to make our pattern the most appreciated of all diatorics.

The Incisors are firmly held in the rubber by a dovetail wedge, which, to give additional security, is traversed by a hole into which the rubber flows.

The Bicuspid and Molars are hollowed out from the base towards the crown to form a chamber, out of which two holes run laterally through the approximal walls. During the vulcanizing process the rubber flows into the chamber and through the holes, thus holding the tooth most securely. Additional anchorage is obtained by the vulcanite in the groove on the lingual surface.

They are vastly superior to any **Composition Pin Teeth** in the market for Strength, Texture, Reliability and Fitness for wear in the mouth.

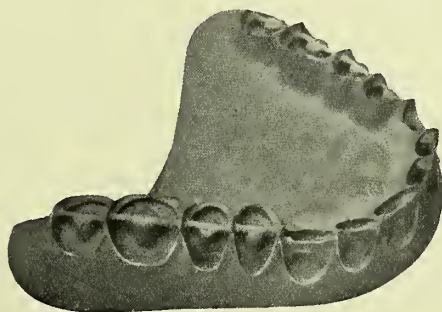
ASH'S MINERAL TEETH.

ASH'S DIATORIC TEETH.



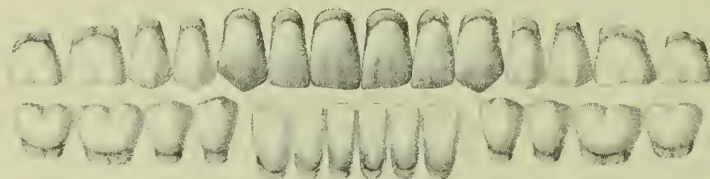
Lingual view of Upper Vulcanite Denture from which the Diatoric Teeth have been dissolved, to show the excellent anchorage obtained by the Vulcanite.

It will be seen from the illustration, that in the process of vulcanizing, both the basal holes and the side holes are completely filled with the Rubber.



SIDE VIEW OF SAME DENTURE,

COMPLETE SETS.



31



55

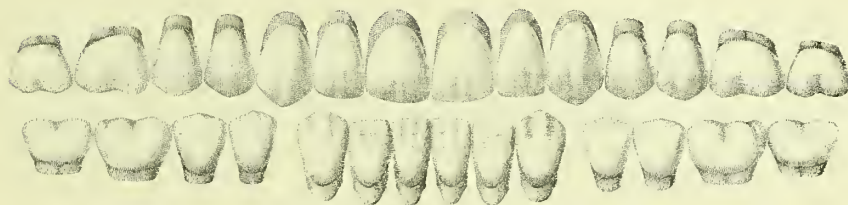
In illustrating a few sets of 28, we would draw attention to the fact that the question of articulation has been carefully studied, with a view to reducing the necessary work of grinding and fitting to a minimum.

To order sets of 28 it is only necessary to state the number which indicates the pattern and size of the set of 6 upper teeth required; the Bicuspids and Molars are matched to the front teeth in proper proportion to their length and width.

The sets of 28 illustrated on this and the following page are samples of what we supply.

ASH'S MINERAL TEETH, Diatoric.

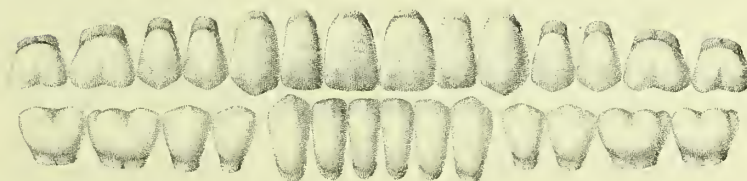
COMPLETE SETS.



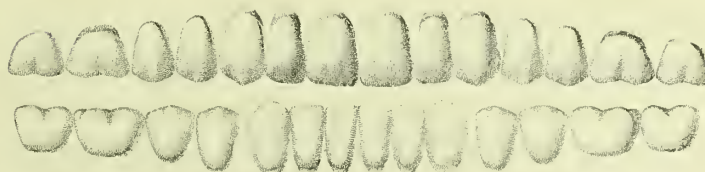
88



129



141



143

ASH'S MINERAL TEETH, Diatoric.

UPPER SETS.



SIDE VIEW.



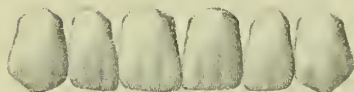
BACK VIEW.

BASE
VIEW.

21



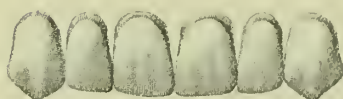
28



22



29



24



31



25



32



35

ASH'S MINERAL TEETH, Diatoric. Upper Sets.



SIDE VIEW.



BACK VIEW.

BASE
VIEW.

50



58



51



59



53



61



54



62



55



63



57



70

ASH'S MINERAL TEETH, Diatoric. Upper Sets.



SIDE VIEW.



BACK VIEW.



BASE
VIEW.



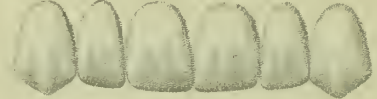
73



79\



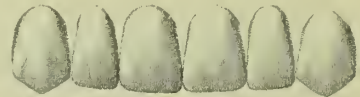
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81



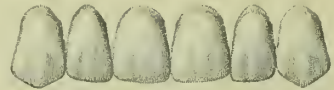
74\



82



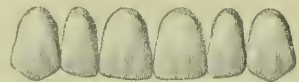
77



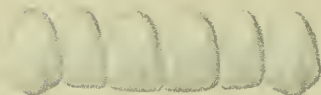
83



78



84



79



85

ASH'S MINERAL TEETH, Diatoric. Upper Sets.



SIDE VIEW.



BACK VIEW.

BASE
VIEW.

88



94



89



95



90



99



91



100



92



101



93



102

ASH'S MINERAL TEETH, Diatoric. Upper Sets.



SIDE VIEW.



BACK VIEW.



BASE
VIEW.



103



115



104



127



105



128



111



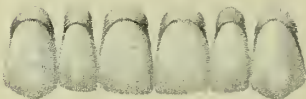
129



112



130



114



131

ASH'S MINERAL TEETH, Diatoric. Upper Sets.



SIDE VIEW.



BACK VIEW.

BASE
VIEW.

132



140



135



141



136



142



137



143



138



144



139

ASH'S MINERAL TEETH, Diatoric. Lower Sets.



SIDE VIEW.



BACK VIEW.



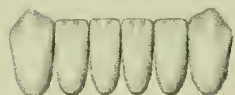
BASE VIEW.



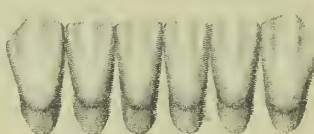
13



26



14



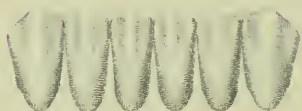
27



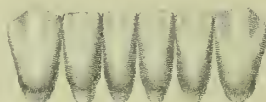
21



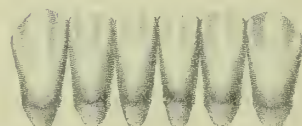
31



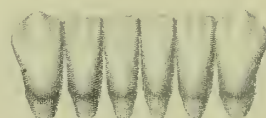
22



32



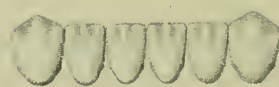
23



33



25



35

ASH'S MINERAL TEETH, Diatoric. Lower Sets.



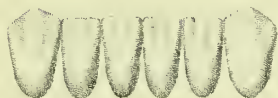
SIDE VIEW.



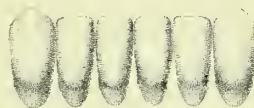
BACK VIEW.



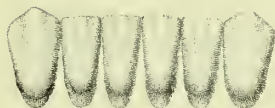
BASE VIEW.



36



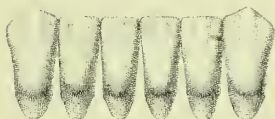
50



37



51



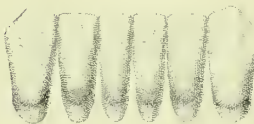
38



54



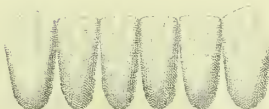
48x.



55



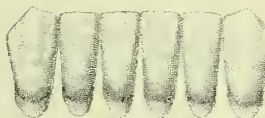
48



56



49



57

ASH'S MINERAL TEETH, Diatoric. Lower Sets.



SIDE VIEW.



BACK VIEW.



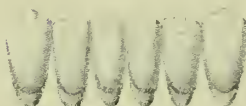
BASE VIEW.



59x



67



60x



68



59



69



60



70



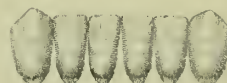
61



72



62



73

ASH'S MINERAL TEETH, Diatoric. Lower Sets.



SIDE VIEW.



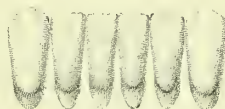
BACK VIEW.



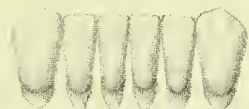
BASE VIEW.



73x



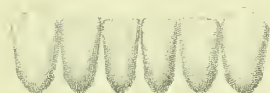
84



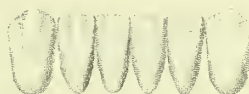
75



85



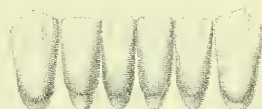
77



86



79



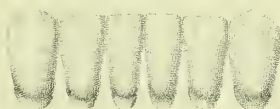
87



80



105



81



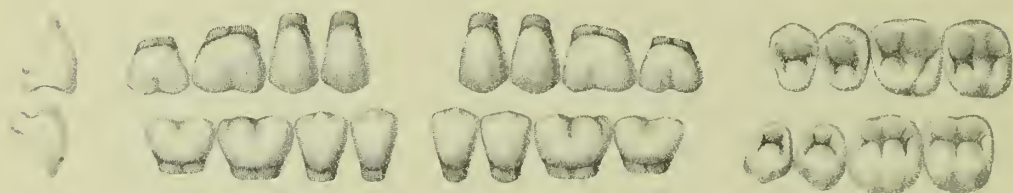
108



83



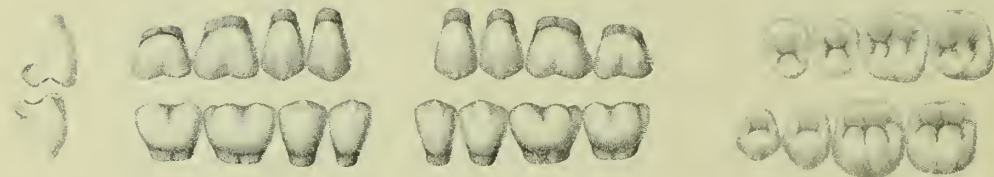
109

ARTICULATED
BICUSPIDS AND MOLARS.

228



229



230



231

The above illustrations represent Sets of 16, but all patterns and sizes are also supplied in sets of eight Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower.

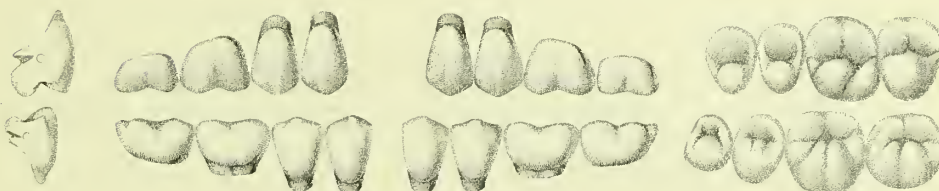
ASH'S MINERAL TEETH, Diatoric. Bicuspid and Molars.



232



233



234



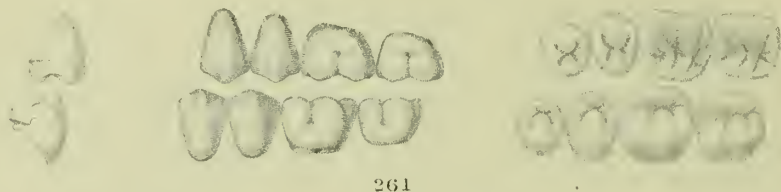
259



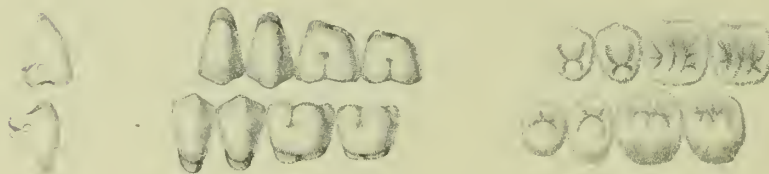
260

The above illustrations represent Sets and Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower.

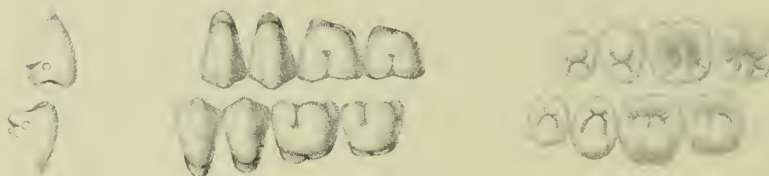
ASH'S MINERAL TEETH, Diatoric. Bicuspid and Molars.



261



262 T.K.



262 T.N.



263 T.K.



263 T.N.

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower,

ASH'S MINERAL TEETH, Diatoric. Bicuspid and Molars.



264 TK.



264 TN.



265 TK.



265 TN.



266 TK.

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower.

ASH'S MINERAL TEETH, Diatoric. Bicuspid and Molars.



266 T.N.



267 T.K.



267 T.N.



268 T.K.



268 T.N.

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower,

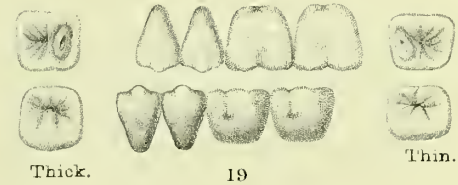
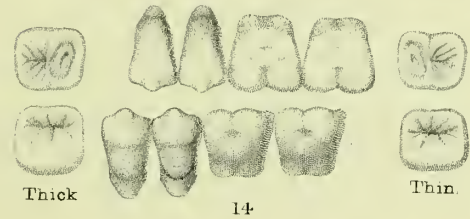
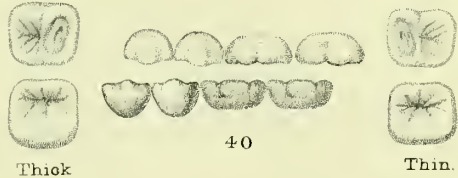
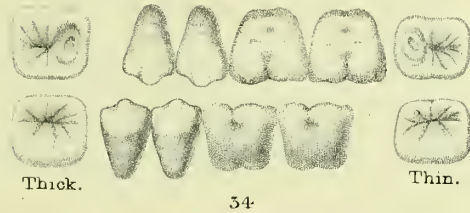
ASH'S MINERAL TEETH, Diatoric. Bicuspid and Molars.



Side View.



Back View.



The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspid and Molars, and in sets of 4 Bicuspid or Molars, both upper and lower,

ASH'S MINERAL TEETH, Diatoric. Bicuspids and Molars.



Side View.



Back View.



21



193



21x



194



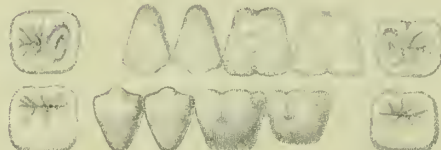
Thick.

14x

Thin.



195



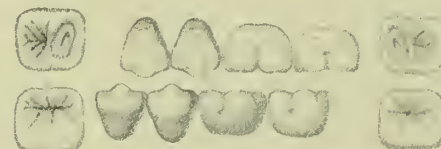
Thick.

15x

Thin.



196



Thick

39x

Thin



197

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower,

ASH'S MINERAL TEETH, Diatoric. Bicuspids and Molars.



Side View.



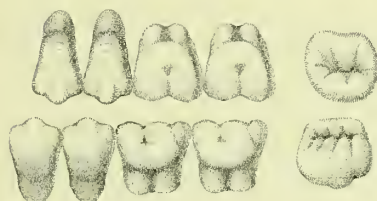
Back View.



198



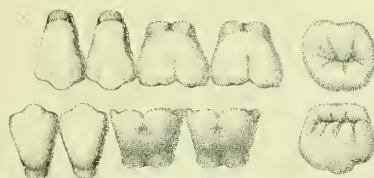
254



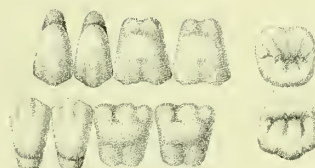
250



255



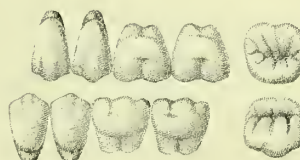
251



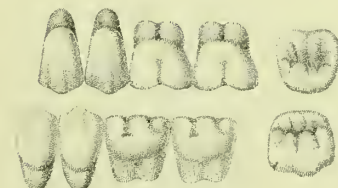
256



252



257



253

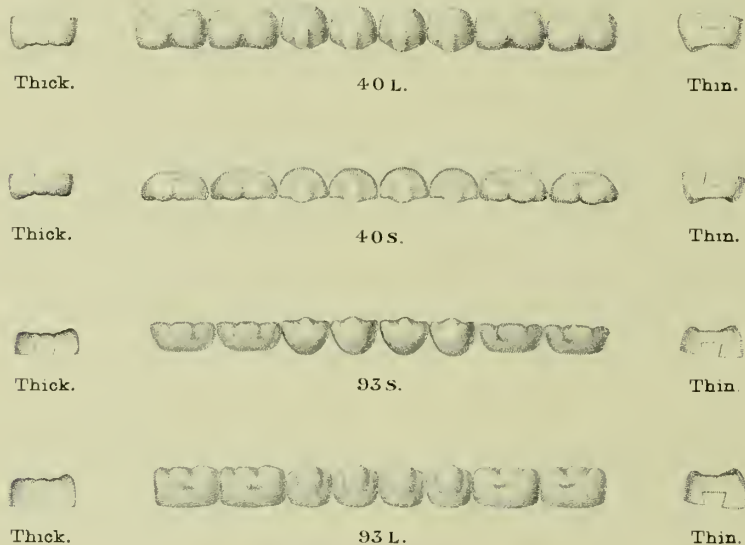


258

The above illustrations represent Half Sets of 16, but all patterns and sizes are also supplied in sets of 8 Bicuspids and Molars, and in sets of 4 Bicuspids or Molars, both upper and lower.

ASH'S MINERAL TEETH, Dovetailed.

BICUSPIDS AND MOLARS,



All the above are also supplied in sets of 4 Bicuspids and Molars.

WEDGE MOLARS FOR ENDS OF DENTURES.



Supplied in Sets of 4.

ASH'S TUBE TEETH.

THE

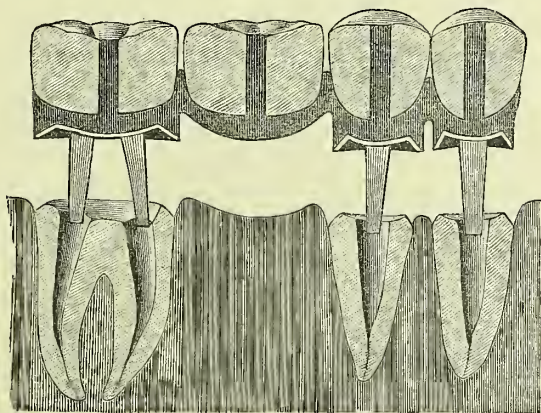
STRONGEST AND SIMPLEST TOOTH

FOR BRIDGE-WORK IS THE

TUBE TOOTH.

Our Tube Teeth are now supplied with and without platinum tubes.

Those without platinum tubes have holes through them of the same diameter as the holes in our Dowel Crowns, to allow of the use of metal posts of the thickness of our No. 5 size wire.

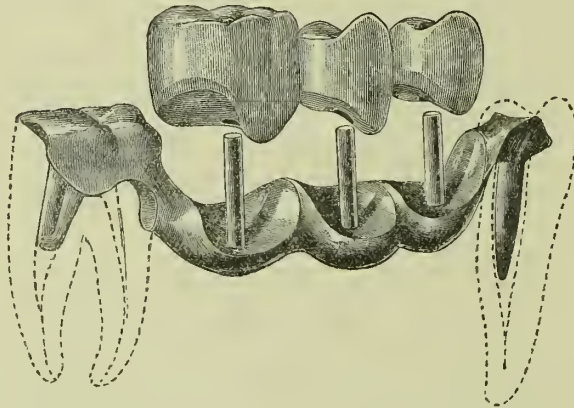


Our Dowel Crowns are made in Centrals, Laterals, Canines, and Bicuspsids in a large variety of sizes and patterns, and in Molars in several sizes; it will thus be seen that, if these are added to the various sizes of Tube Teeth which we make without platinum tubes, the Dentist has at command a sufficiently full range of forms and sizes to cover the requirements of Bridge-Work.

In addition to the superiority in strength which the Tube Tooth admittedly possesses over every other form of tooth, it has one particular advantage in Bridge-Work, when the Bridge is made by the Casting Method, which is now so widely known as the surest and easiest method

THE
STRONGEST AND SIMPLEST TOOTH
FOR BRIDGE-WORK IS THE
TUBE TOOTH.

of making a Bridge, and the advantage is this: After the Bridge has been modelled in wax the teeth can be removed, hence it is the wax only—not the wax plus English mineral teeth or



American porcelain teeth, as must be the case when other than tube teeth are used—which is invested, and consequently the teeth are not subjected to the risk of cracking during the casting process.

In this method of using the Tube Tooth, the old objection to the work of grinding-down the base of each tooth and fine-fitting it to the plate does not hold good; the posts or pins are set in the wax, the tube teeth are set on them, embedded in the wax, removed from the posts before the casting is done, and after the Bridge is cast they are simply cemented on to the posts.

Illustrations of Tube Teeth with and without platinum tubes will be found on pages 113 to 126.

ASH'S MINERAL TEETH, Tube.

WITH AND WITHOUT PLATINUM TUBES.

UPPER SETS.



1



5



2



6



5



7



4



8



5x



9x

Nos. 1, 3 and 7 are also made in longer sizes than illustrated.

ASH'S MINERAL TEETH, Tube. Upper Sets.

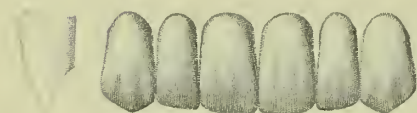
WITH AND WITHOUT PLATINUM TUBES.



9



17



10



18



11



20



12



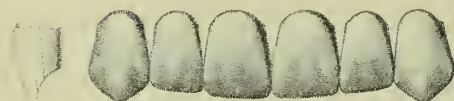
21



14



22



15



27

Nos. 11, 14 and 17 are also made in longer sizes than illustrated.

ASH'S MINERAL TEETH, Tube. Upper Sets.

WITH AND WITHOUT PLATINUM TUBES.



28



43



29



44



31



45



32



46



34



47



42



53

Nos. 31, 34, 42, 44, 46 and 53 are also made in longer sizes than illustrated.

ASH'S MINERAL TEETH, Tube. Upper Sets.

WITH AND WITHOUT PLATINUM TUBES.



54



99



56



100



57



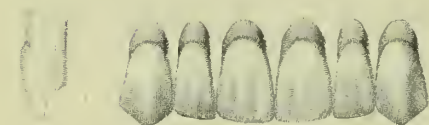
101



58



102



60



103



61



104

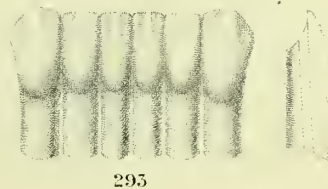
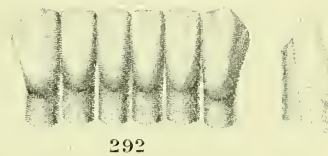
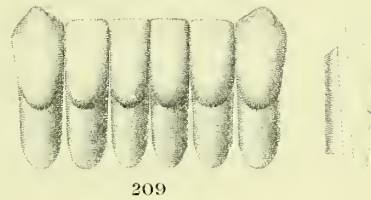
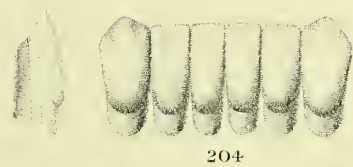
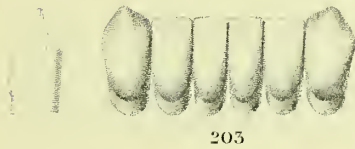
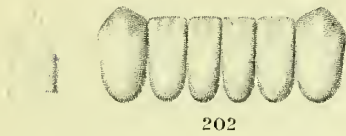


62

Nos. 99, 101 and 103 are also made in longer sizes than illustrated.

ASH'S MINERAL TEETH, Tube. Lower Sets.

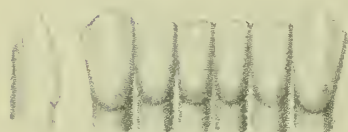
WITH AND WITHOUT PLATINUM TUBES.



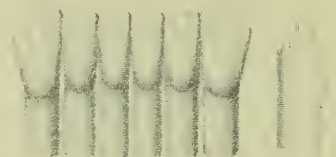
No. 292 is also made in a shorter size than illustrated.

ASH'S MINERAL TEETH, Tube. Lower Sets.

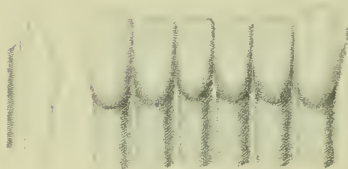
WITH AND WITHOUT PLATINUM TUBES.



294



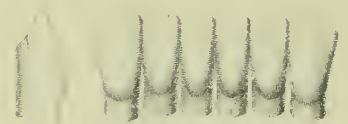
297



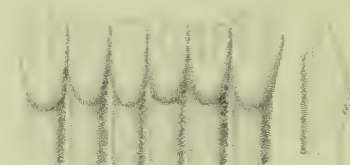
295



298



296



299

Nos. 294, 296 and 298 are also made in shorter sizes than illustrated.

ASH'S MINERAL TEETH, Tube. Bicuspid

WITH AND WITHOUT PLATINUM TUBES.



70



76



71



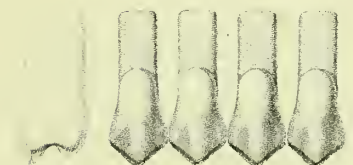
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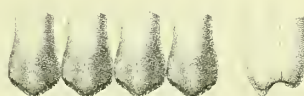
72



78



73



79



74



80



75



81

ASH'S MINERAL TEETH, Tube. Bicuspid

WITH AND WITHOUT PLATINUM TUBES.



82



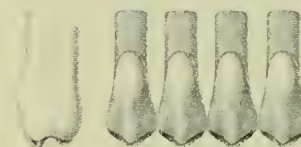
88



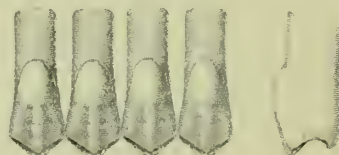
85



89



84



90



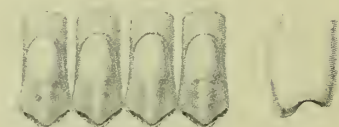
85



91



86



92



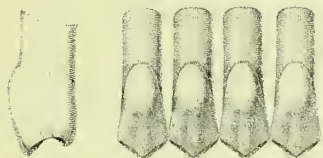
87



93

ASH'S MINERAL TEETH, Tube. Bicuspid

WITH AND WITHOUT PLATINUM TUBES.



94



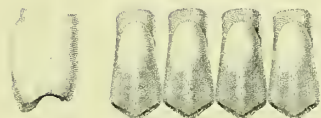
300



95



301



96



302



97



303



298



304



305

ASH'S MINERAL TEETH, Tube. Bicuspid

WITH AND WITHOUT PLATINUM TUBES.



310



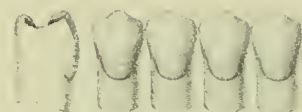
160



311



161



312



162



313



165



314



164



315



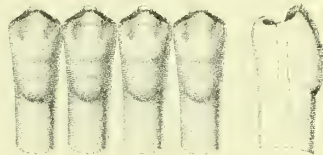
165

ASH'S MINERAL TEETH, Tube. Bicuspid

WITH AND WITHOUT PLATINUM TUBES.



166



171



167



172



168



173



169



174



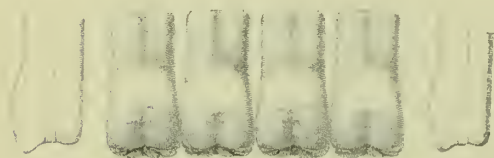
170



175

ASH'S MINERAL TEETH, Tube. Molars.

WITH AND WITHOUT PLATINUM TUBES.



Thick.

51

Thin



Thick.

116

Thin.



Thick.

52

Thin.



Thick.

117

Thin.



Thick.

53

Thin.



Thick.

118

Thin.



Thick.

115

Thin.



Thick.

119

Thin.



Thick.

114

Thin.



Thick.

120

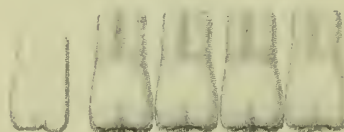
Thin.



Thick.

115

Thin.



121

ASH'S MINERAL TEETH, Tube. Molars.

WITH AND WITHOUT PLATINUM TUBES.



122



300



123



301



297



302



298



303



299



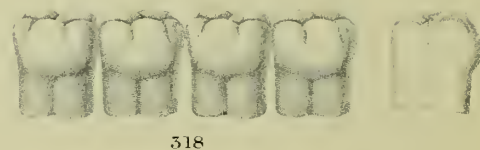
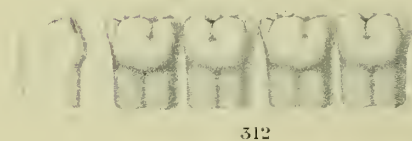
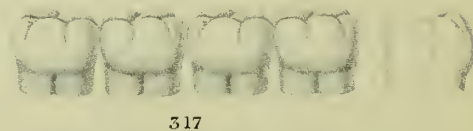
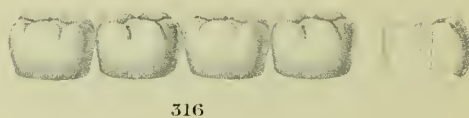
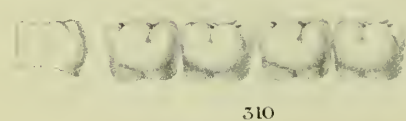
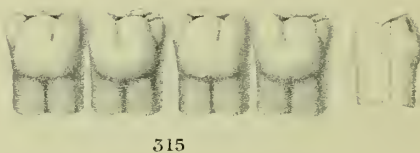
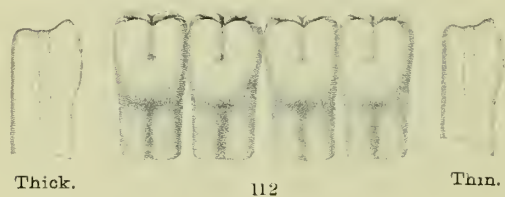
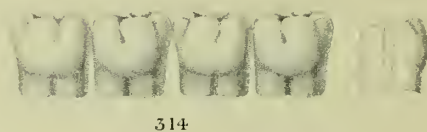
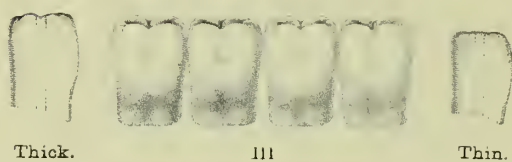
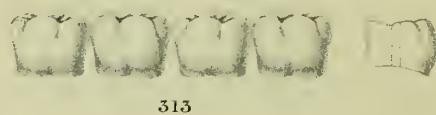
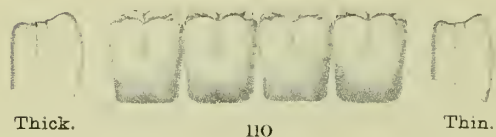
304



305

ASH'S MINERAL TEETH, Tube. Molars.

WITH AND WITHOUT PLATINUM TUBES.



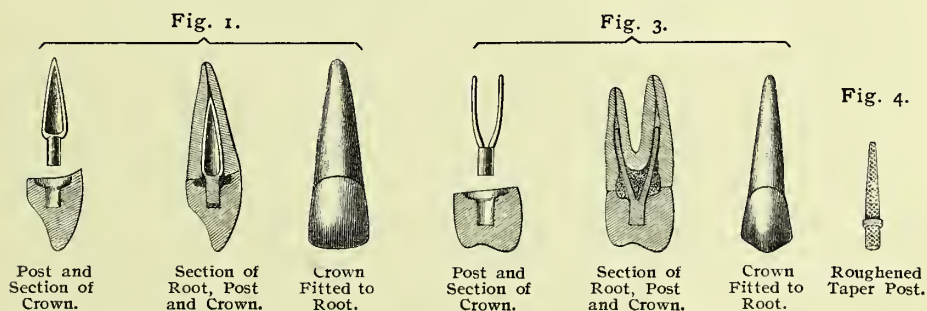
ASH'S MINERAL TEETH.

DOWEL CROWNS.

The principal advantages of a detachable crown, as contrasted with a crown having a pin fixed in the mineral, lie in the facilities afforded for grinding the base of the crown to fit the root and for bending the dowel to the angle required to obtain a correct bite.

In Ash's Dowel Crowns the measurements and shapes of the bases are such as to fit the greatest number of average roots.

POSTS FOR CROWN WORK.



The Fluted Post (Figs. 1 and 2) and the Bifurcated Post (Fig. 3) are made of Dental Alloy, which is more rigid than Platinum. The strongest part in them is the part which has to bear the greatest strain, viz., where the crown joins the root.

Fig. 1 is made in two sizes, large and small. The large size is suitable for upper roots in general, and the small size for the roots of narrow upper laterals and the roots of lower teeth.

Fig. 2. Not illustrated. Similar to Fig. 1 but smaller.

Fig. 3 for the bifurcated roots of bicusps, is extremely strong, and yet the prongs are sufficiently pliable and thin to admit of their adaptation to the bends of root canals.

Fig. 4 is a tapered Post of great strength, made from a stiff white metal. It is roughened all over in such a way as to afford a very firm and secure hold to the cement which is used for joining the Crown to the Post and setting the Post in the Root.

Fig. 5. Not illustrated. Similar to Fig. 4 but smaller.

POSTS FOR VULCANITE WORK.



A—Ash's Aluminium Alloy Post roughened.
 B—Vulcan Tag-Post. C—Vulcan Tag-Posts in Crowns.

In conjunction with the roughened holes in our Dowel Crowns and Non-Platinum Tube Teeth, the two Posts here illustrated afford such a firm hold to the vulcanite that cementing-on is entirely done away with.

ASH'S ALUMINIUM ALLOY POST. (a)

The great advantage of this post is that it does not oxidize during the vulcanizing process and it does not discolour in the mouth.

It is made from stiff aluminium alloy wire of just the right thickness for the rubber to run all round it.

It is an advantage to pack a tiny piece of white rubber down the hole of each Non-Platinum Tube Tooth, before packing the case, as it looks better on the crown than brown or red rubber.

THE VULCAN TAG POST (b)

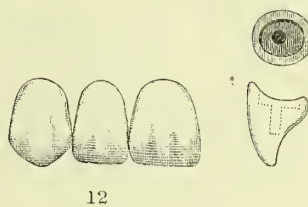
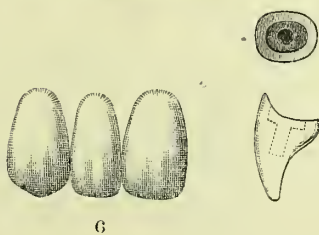
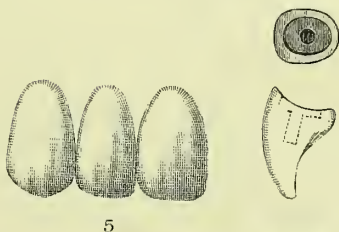
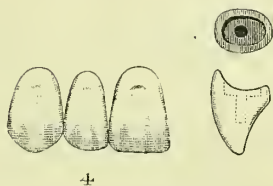
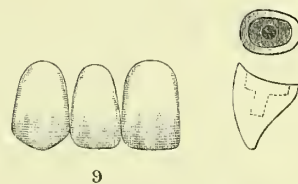
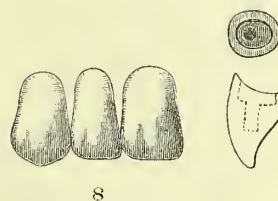
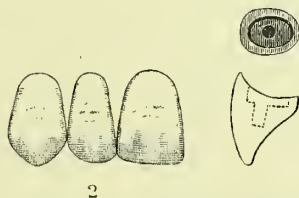
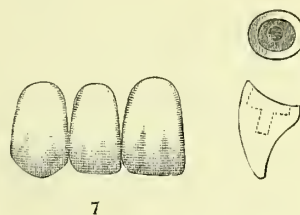
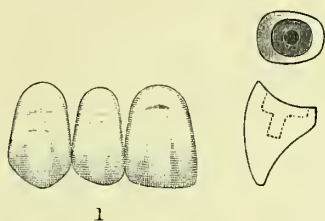
For Dowel Crowns which are let down on to the gum the Vulcan Tag-Post is indispensable; it is very thin, stiff and unbreakable.

For use in Partial Cases the Vulcan Tag-Post[®] is the most suitable.

Isolated Crowns or Tubes can be used upon a denture with every success when the Vulcan Tag Post is employed.

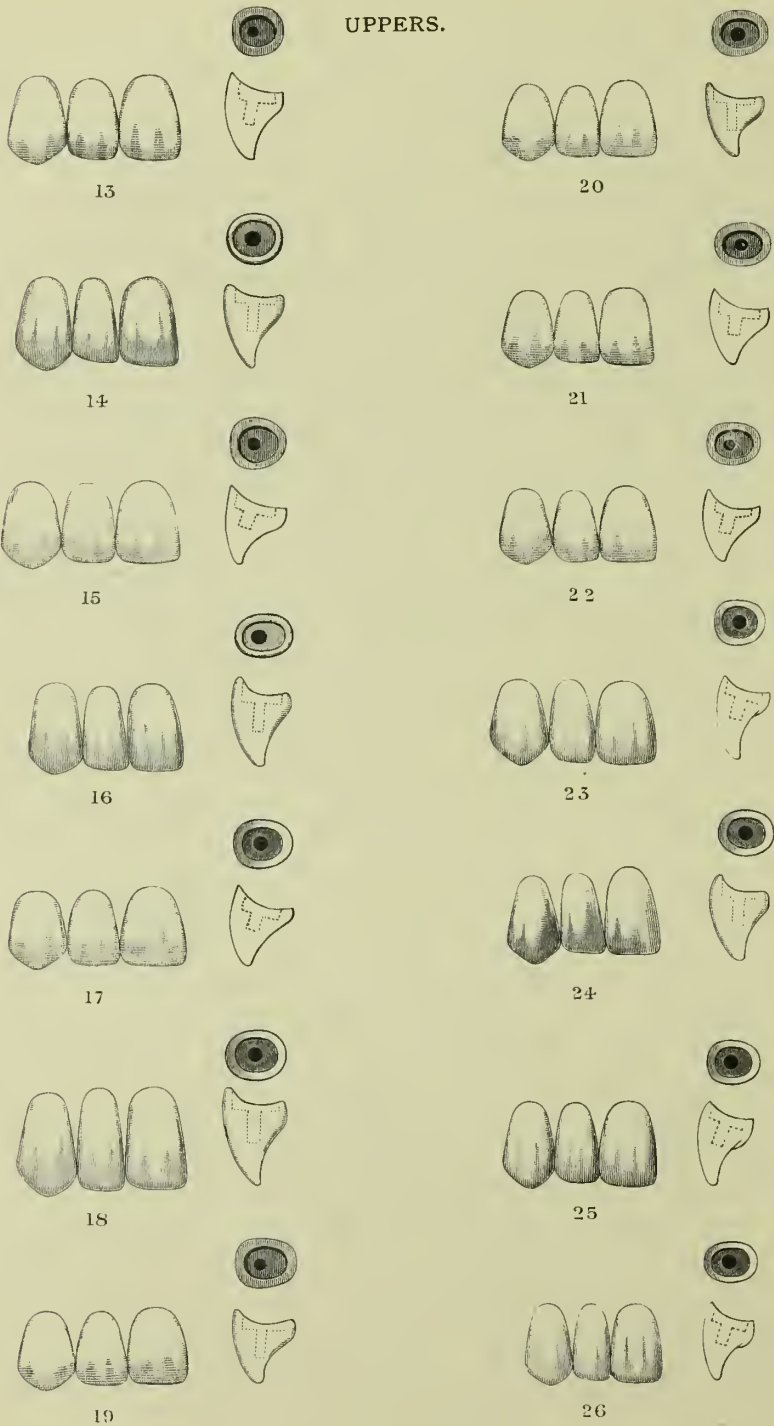
ASH'S MINERAL TEETH, Dowel Crowns.

UPPERS.



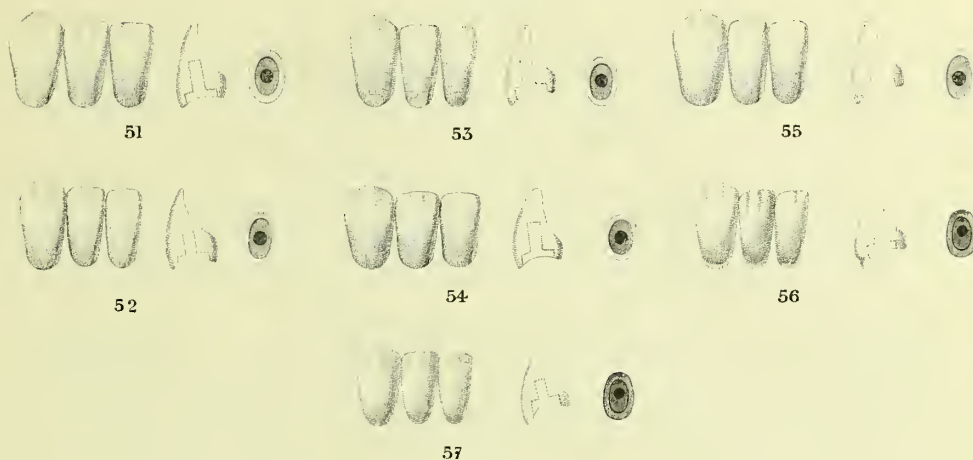
ASH'S MINERAL TEETH, Dowel Crowns.

UPPERS.

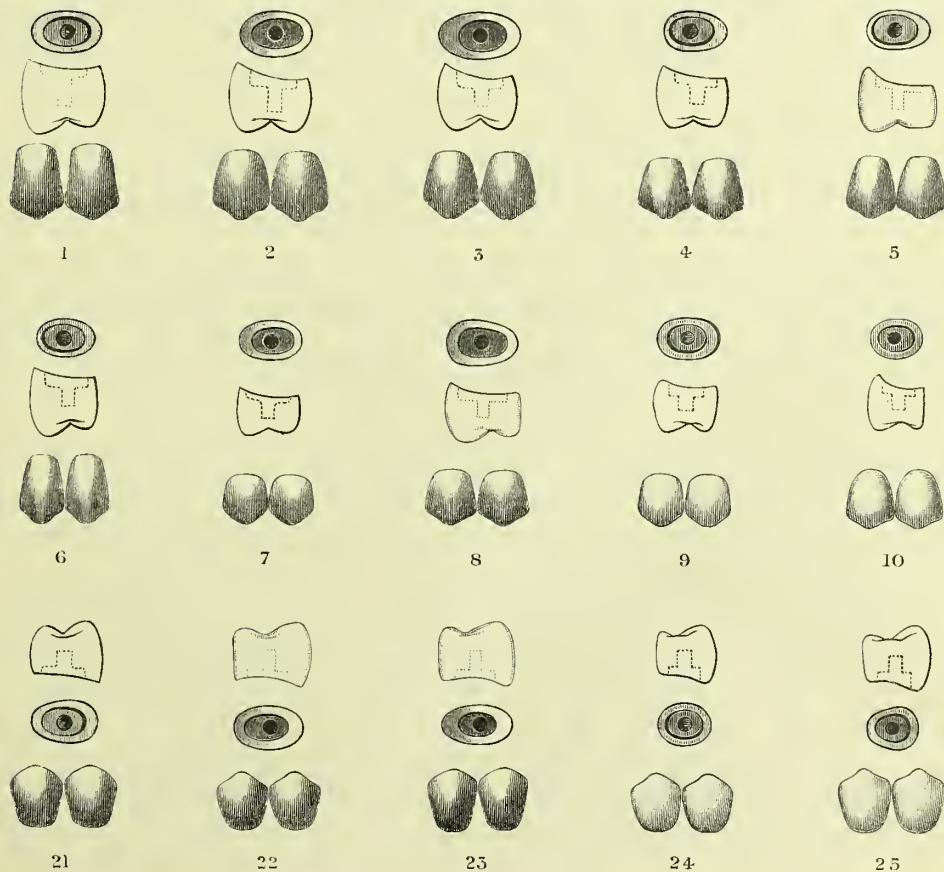


ASH'S MINERAL TEETH, Dowel Crowns.

LOWERS.

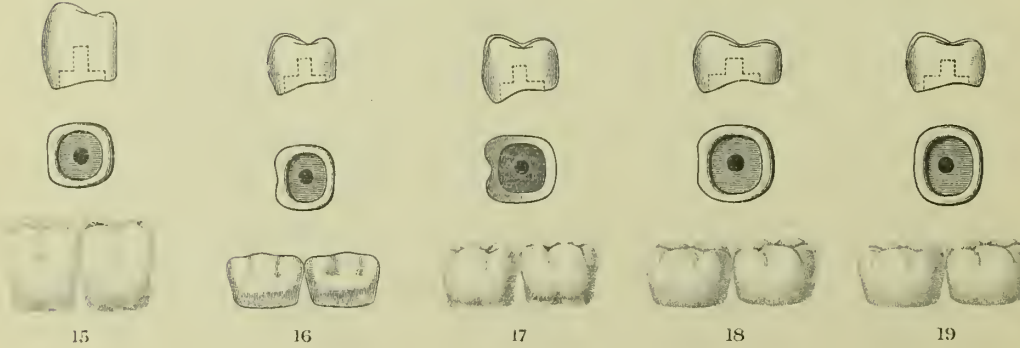
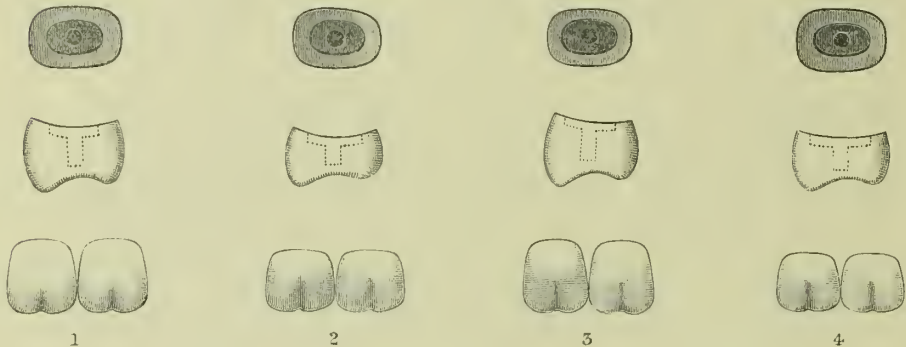


BICUSPIDS.



ASH'S MINERAL TEETH, Dowel Crowns.

MOLARS.



ASH'S MINERAL FACINGS

FOR DENTAL REPAIRS.

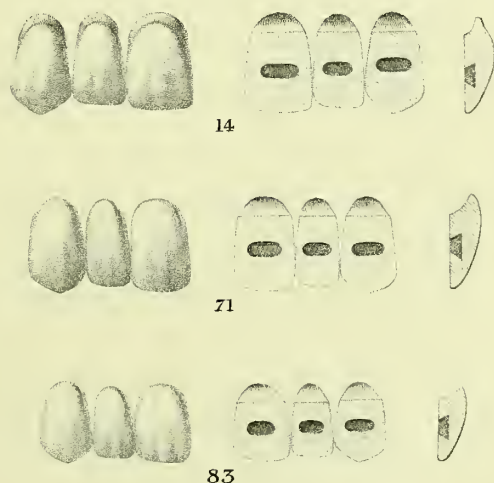
Made in all the patterns and sizes of our Flat Pin Teeth that are starred on pages 1 to 16, also in canines in sizes starred on pages 26 to 29, and Veneer Bicuspids and Molars on pages 34, 35, 39, 40.

The three sizes of our Mineral Facings, here illustrated, are sufficient to show the distinctive feature to which we wish to draw attention, viz., the oval cavity in the back of each.

They can be used for repairing nearly every kind of denture; they are easily applied, exceedingly durable, and can be quickly fitted—it does not take longer than from ten to fifteen minutes to fit one.

They are invaluable for repairs to Bridges, and in all places of Plate and Crown work in which a flat tooth has to be replaced.

The oval cavity at the back of each facing corresponds with the positions of the pins in our Flat Pin Teeth. The facings do not require backing, but can be applied to the backings of fractured or broken teeth when the broken portions of mineral have been removed from the backings.



DIRECTIONS FOR USE.

Chip away the remains of the broken tooth from around the pins in the backing, and roughen the backing with a suitable instrument or tool.

Make a thin mix of Ash's Inlay and Crown Cement, or other suitable Oxyphosphate cement, paint both the tooth backing and the new facing with a thin layer of it, press the facing firmly on the backing, and keep it under pressure until the Cement has thoroughly set.

IMPORTANT NOTE.

On no account must any of the Silicate Translucent Cements be used for attaching our Mineral Facings to teeth backings, etc., because they are not sufficiently adhesive for the purpose.

ASH'S MINERAL TEETH.

RHACHITIC OR HYPOPLASTIC TEETH,

SUPPLIED TO SPECIAL ORDER.



They can be had in any colour or size in Flat and Vulcanite Teeth, and are ground and polished from ordinary stock patterns.

HAND-PAINTED TEETH

FOR SMOKERS AND OTHERS,

SUPPLIED TO SPECIAL ORDER,

In Flat and Vulcanite, Diatoric and Tube Teeth.

Badly stained or discoloured teeth are matched very closely.

The colours are fired after the painting is done, and are so thoroughly and permanently fixed that they cannot be removed by polishing: moreover they will endure in the mouth.

BLACK MINERAL TEETH.

AS USED IN THE FAR EAST.

SUPPLIED TO SPECIAL ORDER,

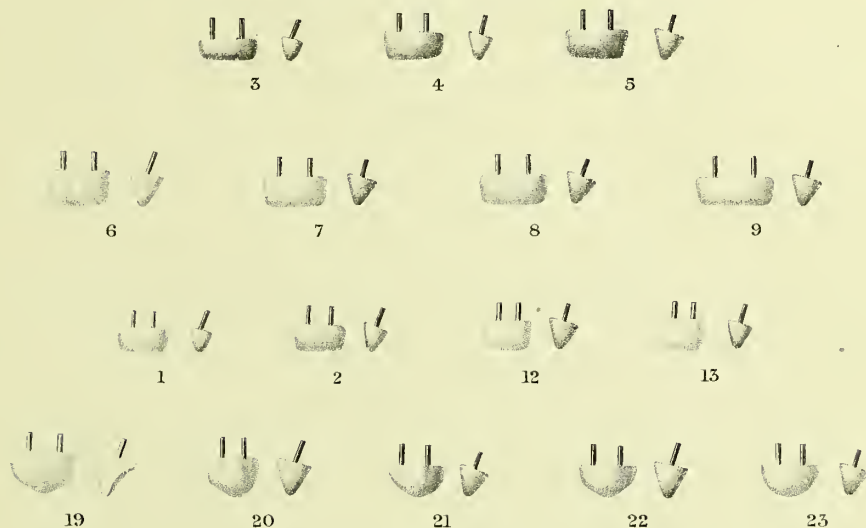
In Flat, Vulcanite and Diatoric Teeth in all sizes and patterns. These Teeth are Black all the way through, and can therefore be ground and polished like our other mineral Teeth.

ASH'S MINERAL TEETH.

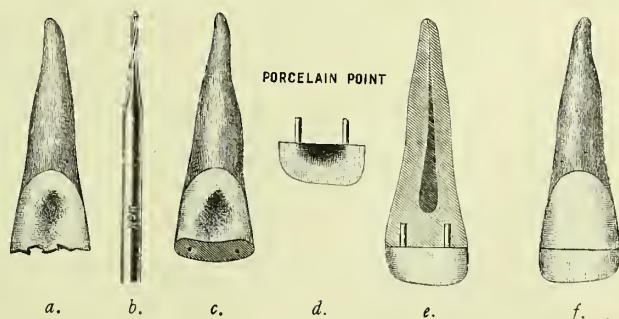
DALL'S MINERAL TIPS.

FOR RESTORING THE INCISAL EDGES OF UPPER ANTERIOR
TEETH.

MADE IN SEVERAL SIZES, AS ILLUSTRATED BELOW.



TREATMENT OF A FRACTURED INCISOR WITH SUCH A TIP AS
ILLUSTRATED ABOVE.



- a.*—The fractured tooth—palatal view.
- b.*—Drill for making holes for the reception of the pins.
- c.*—Prepared tooth ready for Tip—palatal view.
- d.*—The Mineral Tip—palatal view.
- e.*—Section of repaired tooth which shows position of pins in relation to the pulp.
- f.*—Labial view of finished tooth.

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THE ANATOMICAL ARTICULATION AND OCCLUSION OF ARTIFICIAL DENTURES.

BY CHARLES W. ROBINSON.

It is not my intention, in this paper, to dip deeply into all the abstruse problems and discussions which have been and are now being thrashed out in connection with the study of the Glenoid Fossa and the Condylod Movement, in their relation to true anatomical articulation and occlusion, as reproduced on an anatomical articulator, but to write an easily understandable and, I trust, a practical article for those who have not so far made more than a bare surface acquaintance with the subject, and who have possibly been appalled at that first glance by its technicalities and seeming intricacies.

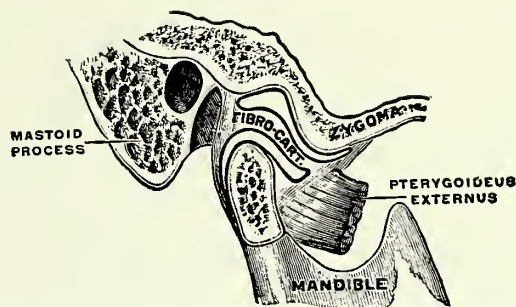
I cannot do better than refer those who would go more deeply into the matter to the many excellent articles that have already appeared on the subject; in particular, to that of Professor Gysi, of Zurich, published in the January, February, March and April, 1910 numbers of the *Dental Cosmos*, and to a paper on the Condylod Path by Mr. J. Morton, of Penrith, published in the *British Dental Journal* of July 15th, 1910.

While I do not, by a long way, hold with all that Professor Gysi says in his work, still I must regard it as a masterpiece of thoroughness and painstaking care in the treatment of a difficult subject.

"Articulation" and "Occlusion" are really purely mechanical problems; they are the reproduction artificially and mechanically of the mechanical movements of the temporo-mandibular joint in conjunction with certain other factors and measurements of a perfect specimen of the mandible. To reproduce this we must first understand the movements of the temporo-mandibular joint. Secondly, we must have an articulatory frame which shall reproduce this articulation and also conform to certain other measurements of the skull, of which more will be said later in this paper. Thirdly, we must also have an apparatus which will convey exactly the relations of the maxilla and the mandible to this articulatory frame, whether the mouth be open or closed.

APPENDIX (A1 continued).

FIG. 1.



Temporo-mandibular articulation in sagittal sections. (Testut.)

The movements of the mandible are very peculiar, insomuch that it can be likened to a bone which possesses a ball-and-socket joint with a gliding motion thrown in—see Fig. 1.

When the mouth is closed so that the teeth meet, the condyles are lodged well in the glenoid fossæ of the temporal bones; when the mouth is opened the movement of the mandible is that of depression; the closing of the mouth may be termed elevation.

Now, if the fingers be placed over the situation of the condyles—that is, about $\frac{7}{16}$ of an inch in front of the external meatus—and the mandible be allowed to make the movement of depression, the condyles will be felt to move forward. Further, if the mouth be then allowed to close, the condyles can be felt to return, the movement ceasing with the occlusion of the teeth. From this it is obvious that the temporo-mandibular joint is not a simple hinge, but possesses a gliding motion along a certain plane, set at some particular angle or other to the horizontal.

There is yet another movement of the human jaw which must be taken seriously into account—that is protrusion.

Protrusion may be of two kinds—direct and lateral. In direct protrusion the mandible is carried forward evenly until the lower incisors occupy a position anterior to that of the upper incisors. In this forward movement all parts of the mandible participate, the condyles gliding forward until they rest on the articular eminences; in retraction from this protrusion to the normal the condyles glide back to their resting-place in the glenoid cavity. In the case of lateral protrusion—which may be to the right or left, according to which condyle is advanced—the condyle on the same side as the protrusion moves neither forward nor backward to any appreciable degree, but remains steady in its glenoid cavity, while the condyle on the opposite side to the protrusion descends along its path. The effect of this lateral protrusion is to deflect the body of the mandible to the side opposite to that of the protruded condyle. Alternating right and left lateral protrusion results in a movement generally called “rotation,” although, to my mind, *swinging* would be a better term.

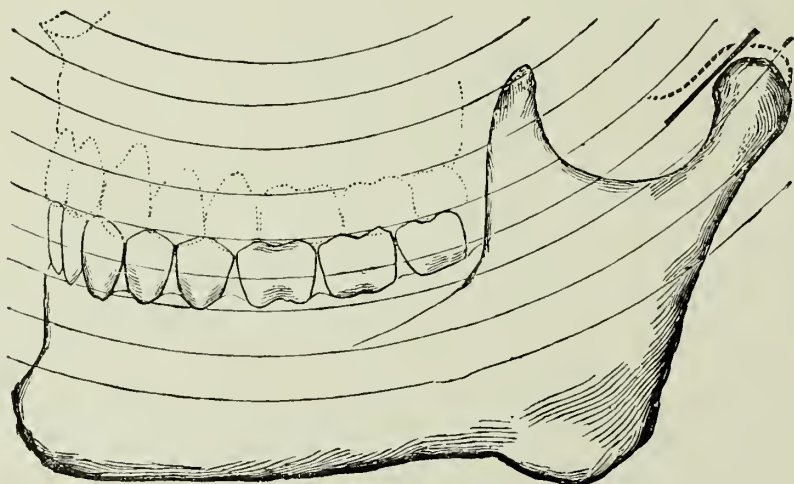
APPENDIX (A1 continued).

All these movements take place during the process of mastication, and may be called forcible movements caused by conscious efforts; but a person does not go about normally with his teeth tightly clenched together—in fact it requires a conscious effort to keep them tightly clenched. What, then, is the position of the condyles in the glenoid cavities during this involuntary parting—or rather, easing—of the teeth when in a state of rest? When in this position the whole temporo-mandibular joint is to all intents and purposes a simple hinge, and really remains so during a partition of the maxillæ amounting to $\frac{5}{16}$ of an inch.

This partition is of no service in what I may call the anatomical movements as in mastication, but it is of the utmost service in the construction of a denture, since it enables us to open the bite for the better accommodation of the artificial teeth, to the extent of $\frac{5}{16}$ of an inch, without disturbing the position of the condyles in the glenoid cavity.

Enough has now been said to enable us to recognise the movements which require to be reproduced in an anatomical articulator. Those who desire a fuller description of these movements of the mandible, together with

FIG. 2.



LOWER JAW, LIFE-SIZE, WHICH SHOWS SPEE'S CURVE.

The concentric arcs show the nature of the jaw's motion during the slide forward, and the short, thick line shows the joint path.

their whys and wherefores, are particularly referred to "The Naked-Eye Anatomy of the Human Teeth," by Mr. T. E. Constant.

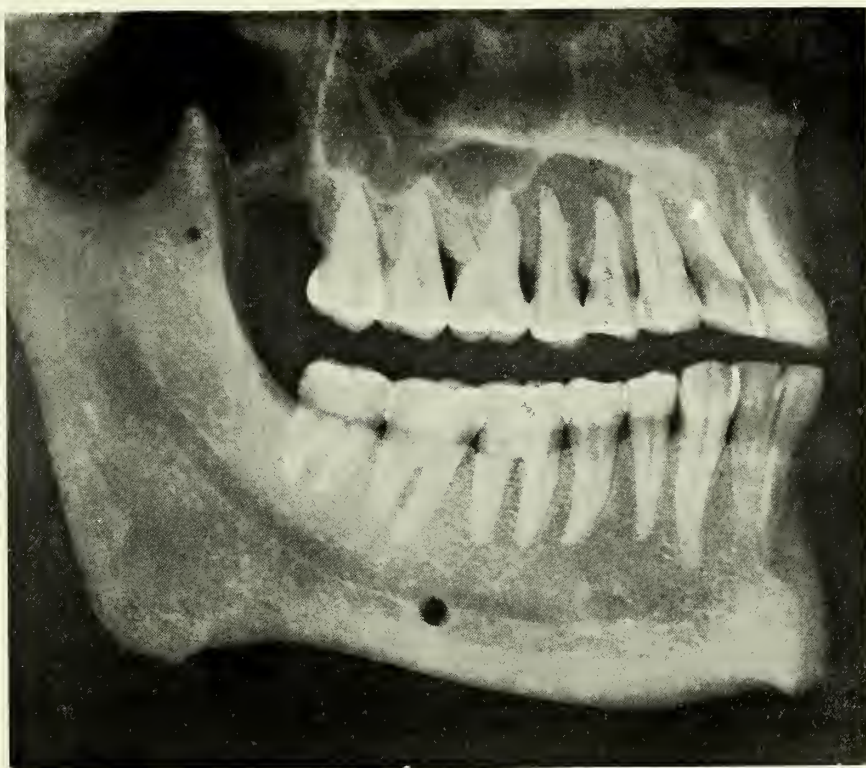
With regard to the occlusion of a set of natural teeth: if we look at the profile view of a skull which possesses a perfectly normal set of teeth, we find that the grinding surfaces of the bicusps and molars are not

APPENDIX (A1 continued).

arranged in a plane, but in a curve with its lowest point at the bicuspid, rising gradually backwards towards the condyles.

This curve is known as the "Curve of Spee," and to Professor Graf Spee we owe the important truth that the path of the temporo-mandibular joint must be in conformity with this curve, for this reason: as the curve itself forms an arc of a circle, so must the condyle path be an arc of the same

FIG 3.



FULLY DEVELOPED JAW WHICH SHOWS SPEE'S CURVE.

Reproduced, with acknowledgments, from Symington and Rankin's Atlas of Skiagrams.

circle, or of another circle which has the same centre, because, if it were not so, it would be impossible to perform the actions of protrusion and retraction, while still keeping the articulating surfaces of the teeth in contact in the way in which it is done by a perfectly normal jaw—see Figs. 2 and 3.

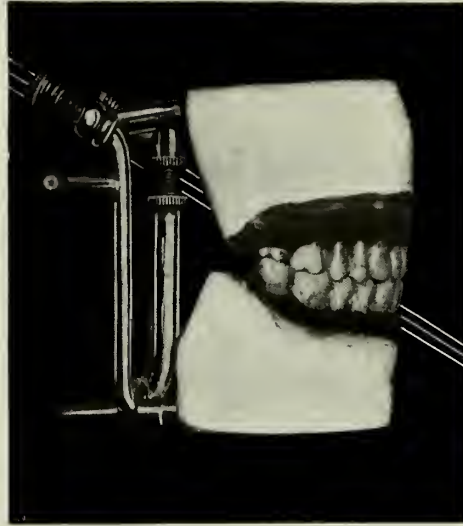
A splendid example of normal occlusion and of Spee's curve is seen in the skiagram of the fully developed jaw (Fig. 3) reproduced from Messrs. Symington and Rankin's Atlas of Skiagrams.

Again, in the perfectly normal jaw, the cusps of each back tooth on either side of the mandible lean inwards at the same relative angle in each

APPENDIX (A1 continued).

tooth to each tooth on the opposite side, thereby causing all perpendiculars erected on all these occlusional angles to be in one and the same straight

FIG. 4.



SHOWS THE DENTAL RIDGES OF THE BUCCAL CUSPS OF THE MAXILLARY PREMOLARS AND MOLARS, PARALLEL WITH THE JOINT MECHANISM OF THE ARTICULATOR.

line. For a full description of the occlusional angles I must refer my readers to the able paper of Dr. Bernard Frank, which appeared in the April 1, 1908, number of the *British Dental Journal*.

This even inclination of all the occlusional angles causes the teeth to retain contact or occlusion during the sagittal swing of the mandible, and constitutes what is termed a side or slide bite; that is to say, when the mandible is moved to one side, as in mastication, proper occlusion of all the teeth is still maintained; on the side to which the mandible is moved the articulating surfaces of the bicuspid and molars are in close contact on at least half their respective surfaces—see Fig. 4—and on the opposite side contact is still maintained at definite points on the bicuspid and molars, while the canines and laterals come practically edge to edge—see Fig 5.*

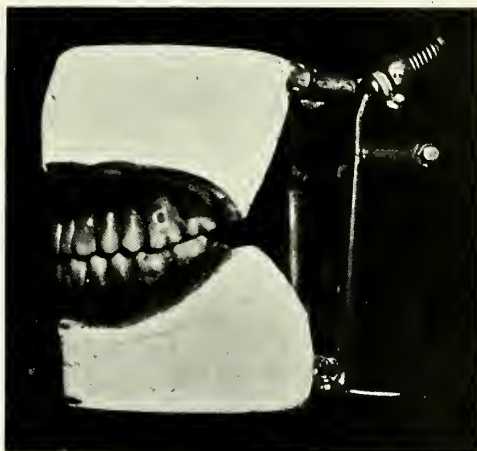
I may here mention that proper occlusional contact is usually only maintained during a swing extending over *three-quarters of the width of a lower central*.

* I have used sets of artificial teeth set up on an anatomical articulator for Figs. 4 and 5 as my photographic subjects, for two reasons; first, because it was far easier to photograph these than it would have been to photograph the jaws themselves; and, secondly, because it also serves the purpose of demonstrating the ability to reproduce artificially and yet perfectly the "side bite" of a perfectly normal jaw.

This side bite is of the greatest use in the proper comminution of food.—C. W. R.

APPENDIX (A1 continued).

FIG. 5.



CONTACT MAINTAINED AT DEFINITE POINTS ON THE BICUSPIDS AND MOLARS.

Of course, I am well aware that this happy state of perfectly normal occlusion is very rarely found in individuals—there are so many causes and chances occurring to prevent it—but I do hold that when we make artificial plates there is no reason why we should not reproduce the really normal state of things instead of the abnormal, which (strange paradox!) is the general condition of affairs in human mouths.

We have the mouth to work on, bared of all teeth—then why not replace the teeth according to the natural order of things, instead of following the abnormal state which has been produced by circumstances over which we have no control.

It is this generally abnormal state which has induced certain writers on this topic to state boldly that we cannot reproduce the mouth artificially, or, rather, the teeth and occlusion as they exist.

It is not always desirable to do so exactly, especially when a normal order of things would give a better result.

.

So far, we can understand that our truly anatomical articulator must have two angles so set as to represent the temporo-mandibular joint path, and along which one of the attachments which bear the models of a mouth must freely move. With this angle and movement we shall be able to reproduce the proper occlusion and articulatory movements of what a normal mouth should be.

Further, the articulator must be of a certain width between the angles, to conform with the width between the condyles in the human skull. This inter-condyloid measurement may, I think, be fairly taken as anything between $3\frac{1}{2}$ and $4\frac{1}{2}$ inches.

APPENDIX (A1 continued).

Again, the articulator must be fitted with an adjusting screw to raise or lower the arms which hold the models, and the adjustment must be of suitable width to take the models and bite before they are put on. Afterwards the arms may be readjusted to open the bite, if necessary, but only to the extent of $\frac{5}{16}$ of an inch. This is permissible because, as I have previously stated, the temporo-mandibular joint acts as a simple hinge to the extent of $\frac{5}{16}$ of an inch.

There are several anatomical articulators which may be said to fulfil these conditions, of which one of the best, in my opinion, is that of Professor Carl Christensen, of Copenhagen; but there is another condition to be fulfilled, which, as far as I know, reduces our practical articulators to three.

The condition is this: there must be a method by which the models must be placed in the articulator at the exact *distance* and *relation* to the angles of the articulator, as the jaws from which the models were taken had their own temporo-mandibular joint path, of which the angles on the articulator are a representation.

All honour to those gentlemen, Prof. Walker and Dr. Bonwill, who have given their thought and labours to this subject. Prof. Walker's articulator is a marvel of ingenuity, but too complicated for everyday practice. Dr. Bonwill's is ingenious and simple, the result of much observation and experiment; but it can scarcely be said that Dr. Bonwill's four-inch equilateral triangle will exactly suit every case.

The three articulators which I have in my mind are the productions of three gentlemen: Prof. A. Gysi, of Zurich, Switzerland; Prof. G. B. Snow, of Buffalo, New York; and Mr. Joseph Morton, L.D.S., of Penrith, England.

These gentlemen have devised an instrument, called by Prof. Gysi a "register," and by Prof. Snow and Mr. Morton a "face-bow," in addition to an articulator frame. **This instrument records the relative position of the jaws to their joint path, and afterwards reproduces that position on the articulator frame.** I do not purpose here to give a detailed description of Prof. Gysi's articulator and register, with the special holder designed to take the register when the models are being placed in the articulator frame, but to refer my readers to his book, or, rather, to the translation by Dr. Oscar T. Wayne, published in the *Dental Cosmos*.

Suffice it to say that Prof. Gysi's articulator differs in a great many ways from any other existing articulator, notably thus: In addition to the usual movable angles which can be reset according to the particular angle or angles of each individual case, the inter-condyloid distance can be varied by means of a couple of supporting pins which move in a sliding groove; there is also a supporting pin, which acts as a guide to the height of the bite and has a steadier to the top bow of the articulator; there is likewise a small inclined plane attached to the lower bow of the articulator frame at the bottom of which the supporting pin rests when the bite is closed, and travels up it in the side movements.

APPENDIX (A1 continued).

Prof. Gysi says: "This inclined plane forms the incisor guide, and serves on the articulator as a substitute for the overbite. The supporting pin acts as a guide to the height of the bite; it is placed in front of the incisors. The most important function of this supporting pin and inclined plane consists in the prevention of the wrong downward movement of the upper part of the articulator, produced in all articulators up to this time when reproducing lateral movements."

Prof. Snow's face-bow, to quote his own words, "consists of a mouth-piece, to be attached to the upper trial plate, and a bow which surrounds the face and carries upon it a swiveling clamp, by means of which it may be firmly attached to the mouth-piece."

"Upon either extremity of the bow is a sliding pointer, with a clamping nut for fastening it."

"The usual steps taken towards fitting the trial plate in the mouth comprised in the term 'taking the bite' are all to be performed before the face-bow is brought into use."

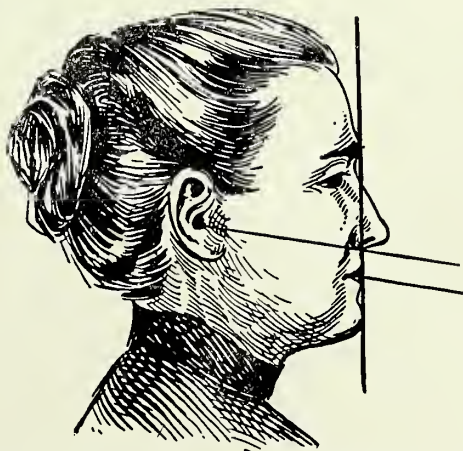
"And in trimming the trial plates their occlusal surfaces should be trimmed flat and to the 'occlusal plane.'"

"This has been defined by Dr. Walker as a plane tangent to the cutting edges of the lower incisors and the disto-buccal cusps of the second molars."

"According to him this imaginary plane forms an angle of about 75° with the 'facial line'—a vertical line touching the forehead, lips, and chin."

"The angle varies slightly in different individuals, but as a starting point a line drawn from the lowest point in the external auditory meatus to the root of the nose may be taken, as it will be very near to the correct angle—see Fig. 6."

FIG. 6.



SHOWS THE VERTICAL FACIAL LINE, THE CORRECT ANGLE LINE, AND THE ORAL LINE PARALLEL WITH THE CORRECT ANGLE LINE.

APPENDIX (A1 continued).

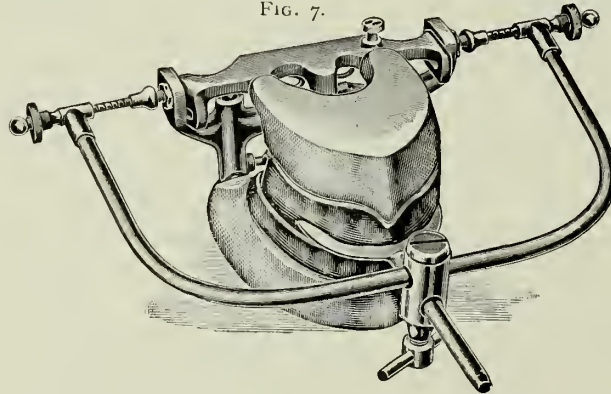
"And the occlusal surfaces of the trial plates should be trimmed so that if a straight strip of thin metal were held between them, projecting for a distance from between the lips, it would be seen to be parallel with this imaginary line."*

Prof. Snow's method of taking the relative position of the mouth to its condyles is to attach the mouth-piece to the upper trial plate so that it will be central with it, and at the same time parallel with the previously determined "occlusal plane;" then to mark the position of the condyles upon the patient's cheeks, and adjust the pointers at the ends of the face-bow so that they will just pass the cheeks and also be equidistant from the ends of the bow. The pointers are scored to facilitate this. When correctly adjusted they are fixed by their clamp-nuts.

The rod of the mouth-piece attached to the wax bite-pieces in the mouth is then passed through the swiveling clamp on the face-bow, which is then tightened up.

The complete face-bow, with mouth-piece and bite-pieces and models attached, is then transferred to the articulator frame, on the artificial

FIG. 7.



FACE-BOW WITH MOUTH-PIECE, BITE-PIECES, AND MODELS ATTACHED TO ARTICULATOR.

condyles of which there are two knobs to receive the ends of the face-bow—see Fig. 7.

Prof. Snow's articulator frame is fitted with adjustable angles, so that the models with face-bow attached are put in horizontally with the "occlusal plane" and angle pieces. Afterwards, the angle pieces are adjusted to those of the temporo-mandibular joint paths of the particular patient, in accordance with the method introduced by Prof. Carl Christensen, by the help of a small instrument designed by Prof. Snow and called by him a bite gauge, which he uses in place of the lumps of wax employed by Prof. Christensen.

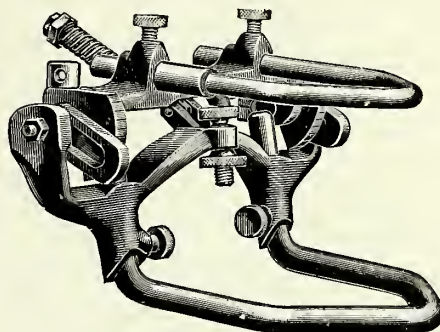
* "The Articulation of Full Artificial Dentures," by G. B. Snow, D.D.S.

Booklet sent post free on application. C. A., S. & Co. Ltd.

APPENDIX (A1 continued).

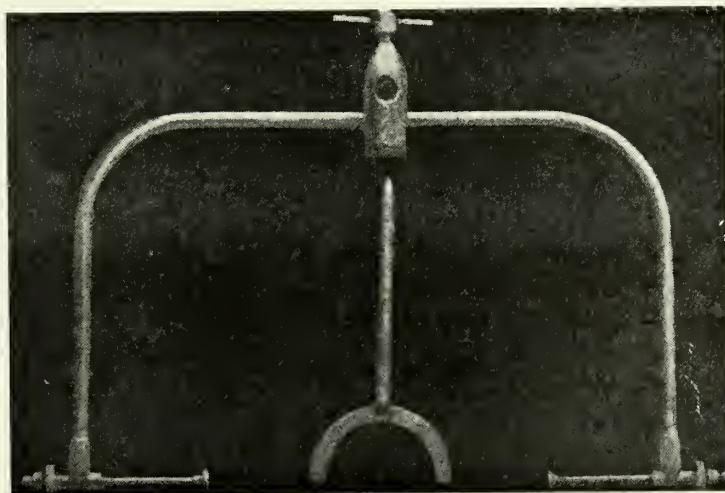
A general idea of Prof. Snow's articulator may be obtained from Figs. 8 and 9.

FIG. 8.



SNOW'S ARTICULATOR.

FIG. 9.



SNOW'S FACE-BOW AND BITE-PLATE.

The face-bow and articulator designed by Mr. Morton, of Penrith, is the one which I prefer, because I believe it to be simpler in use than any other, and to take up less time at a sitting, owing to an arrangement whereby the taking of the bite, the "occlusal plane," and the relative position of the mouth to its joint-path can all be done at one and the same time; the external auditory meatus is also used as a rest for the ends of the face-bow; the time and trouble of marking the position of the condyles are thus saved.

I therefore purpose to give a full and complete description of Mr. Morton's face-bow and articulator.

APPENDIX (A1 continued).

Fig. 10B is a representation of Mr. Morton's complete articulator, which consists of seven parts, namely, a face-bow, two bite-plates, two spirit-levels, an articulator frame, and a lip-line instrument.

The face-bow (1) consists of two curved rods with ends like those of a stethoscope end. The rods are connected by two flat steel springs with a small straight cross-bar. On this cross-bar hangs a swiveling clamp to take and hold the mouth-pieces, or, as Mr. Morton calls them, the bite-plates.

There are two bite-plates—one a flat curved piece of metal attached to a straight rod (2); the other, two metal arms attached to a straight rod by a swivel nut which renders the width of the arms adjustable (2A). On these arms are attached eight riders, each one capable of moving in any position along the arms, or of being entirely removed if not wanted.

The flat bite-plate is for use in full edentulous cases, or in cases in which either the maxilla or the mandible is edentulous.

The bite-plate with riders is for use in partial cases, a rider being moved into any position where a tooth is absent.

Attached, pendant, to one of the curved rods of the face-bow, by a swivel nut which admits of its being set and tightened in any position, is a very small spirit-level (3), which is used for taking the "occlusal plane" in a manner to be described later on.

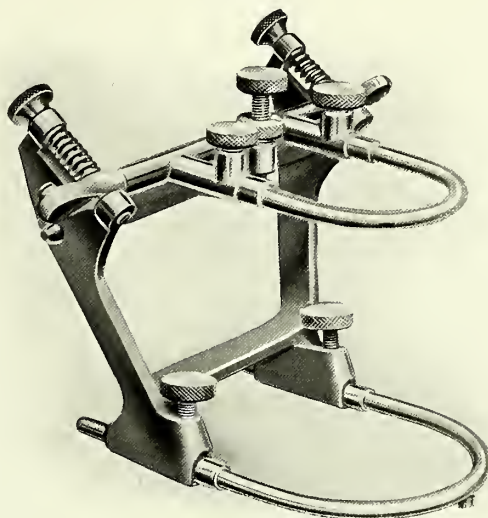
Mr. Morton's articulator frame (4) consists of two bows, to which the models are affixed with plaster. An upright set-screw is set fair in the centre for raising or lowering the "bite" a width between the artificial condyles of $4\frac{1}{4}$ inches. The angles from these condyles, representing the joint-path, are set at a fixed point of thirty-five degrees. Mr. Morton believes, as the result of his researches, this to be the mean or average angle of the human joint-path.

Behind the artificial condyles two small knobs are set, which are intended to represent the external auditory meatus, and on which the stethoscope-like ends of the face-bow may be placed. These knobs are set on an imaginary vertical plane, which is parallel to another imaginary vertical plane passing through the centre of the artificial condyles, and $\frac{7}{16}$ of an inch from and behind it. This places the knobs at the same relative distance from the artificial condyles as the external auditory meatus has to the condyles in the human mouth. I stated this measurement in the beginning of this paper.

In addition to the articulator frame and face-bow with bite-plates, Mr. Morton has a small instrument which he calls a lip-line cup (5). It is a small nickel-plated article, which is covered with composition and then placed between the gums at the front of the mouth. The lips are then allowed to fall into a natural position of rest, and a line is scratched with some sharp instrument on the composition, to denote the position of the lips. Mr. Morton thus attains at one and the same sitting the approximate heights at which to place the artificial teeth.

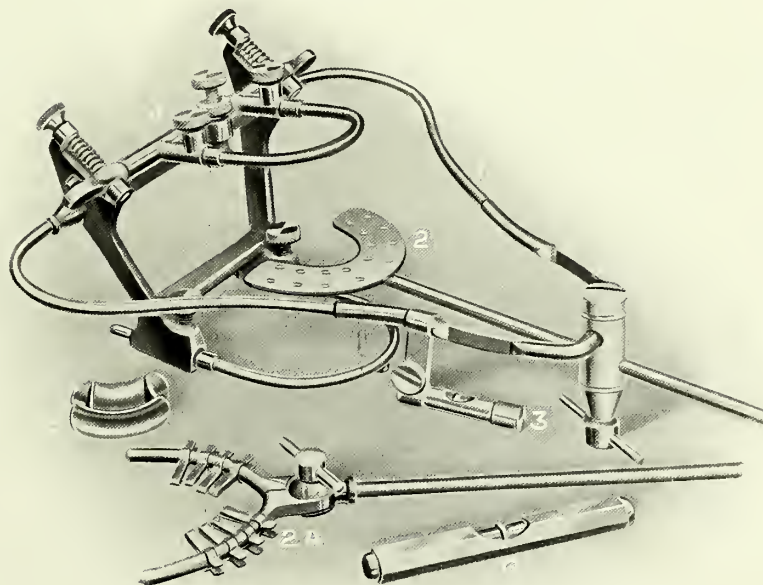
APPENDIX (A1 continued).

FIG. 10A.



MORTON'S ARTICULATOR, MINUS ACCESSORIES.

FIG. 10B.



MORTON'S COMPLETE ARTICULATOR.

- | | | |
|----------------------|-----------------------|-----------------|
| 1—Face Bow. | 2, 2A—Bite-Plates. | 3—Spirit Level. |
| 4—Articulator Frame. | 5—Lip-Line Cup. | |
| | 6—Large Spirit Level. | |

Mr. Morton's method of using his face-bow and articulator is as follows:—A little modelling composition is softened and placed on both sides of the bite-plate. The bite-plate and composition are then inserted in the mouth and pressed into position—as though taking an impression—on to the maxilla, and the patient is instructed to bite up into the soft composition on the under side of the bite-plate, the operator steadying the chin while this is done to prevent the patient biting forward (Fig. 11A). The curved spring-bow is slipped on to the rod of the bite-plate through the swiveling clamp, the knobs of the spring-bow are placed into the cavity of the ears, the swiveling clamp is tightened, and the bite-plate is thus firmly held. The patient's head is now moved forward or backward until the pupil of the eye is seen to be truly in the centre and looking straight forward. The patient's eyes in this way form a natural spirit-level which denotes an imaginary horizontal plane. The spirit-level on the face-bow is then adjusted until that too denotes a horizontal plane, which must, of course, run parallel with the horizontal plane made by the eyes. The locking nut of the spirit-level is then fastened—see Fig 11B.

By reproducing this horizontal plane with the models in exact relation to it as the mouth had to the same horizontal plane, the "occlusal plane" must also be reproduced in each case.

SETTING UP.

The bite-plate with face-bow attached to it is now removed from the mouth. Great care in this and all subsequent operations must be taken to see that the spirit-level is not bent from its position.

The composition on the **bite-plate** is now cut away from both sides until there remain only the tips of the impressions made by the teeth or gums.

The models, after having been cut and trimmed up nicely, are placed in these impressions and waxed in, to hold them firmly in position.

The articulator frame is now placed, with its base, which must not be allowed to be bent by the careless handling of young assistants, on a perfectly smooth level surface.

A piece of sheet glass, levelled by a spirit-level, is a very good thing to use, as the glass gives a fine smoothness to the plaster poured on the base, and it is easy to detach the articulator from the glass after the bite has been poured.

This level surface represents the horizontal plane made by the eyes.

The ends of the face-bow are now sprung over the two knobs on the articulator frame which are at the back of the condyles, and which represent the ears of the patient.

A good heap of soft mixed plaster is now poured on to the base of the articulator frame, and the lower model, attached to the face-bow, is allowed to sink slowly into it, until the **spirit-level, on the arm of the face-bow, again denotes a horizontal plane, running parallel with the plane of the base—see Fig. 12a, page 153.**

APPENDIX (A1 continued).



FIG. 11A.
Shows how patient should bite.



FIG. 11B.
Shows Bite-Plate and Face-Bow in position.

APPENDIX (A1 continued).

It is essential that the models be kept in the centre of the articulator frame. This is almost automatically assured by the action of the flat steel springs of the face-bow, which tend to keep them always straight in the centre, so that a little practice makes this a certainty.

Some more soft plaster is put on to the upper model, and the upper bow of the articulator is lowered into it—see Fig. 12B.

When the plaster has set the articulator may be removed from the glass slab; and the face-bow taken off the models, by gently warming the composition on the bite-plate over a Bunsen burner to soften the wax which holds them. The bite can then be closed to its proper position as indicated either by the standing teeth, if it be a partial case, or by the heights indicated by the lip-line Cup, which can be inserted between the models, as it was between the gums in the mouth, and the heights marked off with the aid of a pair of dividers.

After determining the position of the models and fixing them by means of the set-screw at the back of the articulator frame, it must be remembered that they are not to be reset or opened again by more than $\frac{5}{16}$ of an inch, measuring from between the incisors.

It is, of course, as well subsequently to try the dentures in the mouth before finishing, to make sure that the patient has not bitten wrongly.

Should it be necessary to change the bite, it must be borne in mind that it is the lower model, not the upper, which must be altered in position.

The upper model on the articulator represents a fixture, exactly as the maxilla is a fixture in the skull; from it is obtained the "centre," and also the "occlusal plane."

It must also be borne in mind that if we wish to retain the same exactness as heretofore in all things, the upper model must also be retained in the same relative position to the horizontal plane of the base as before.

This can be done in one of two ways, viz.: first, either by again placing the base of the articulator frame on a perfectly level surface and measuring with the aid of dividers the distance between a point on the upper model and the base; or, secondly, by fitting a spirit level to the upper model and levelling it, as well as the model on the base.

The measurement by distance is, of course, the easier.

.

Having finally got the models placed anatomically correct in the anatomical articulator, the next work to be done is the arrangement of the teeth in as anatomically correct a manner as it is possible for us to attain, with the anatomical teeth now at command.

APPENDIX (A1 continued).

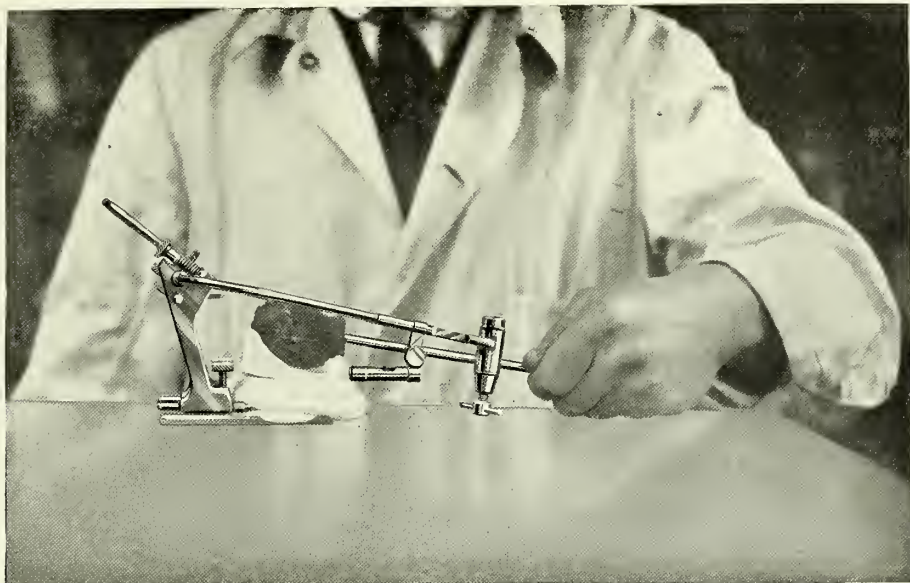


FIG. 12A.

Shows the lower model being sunk into the soft mixed plaster.



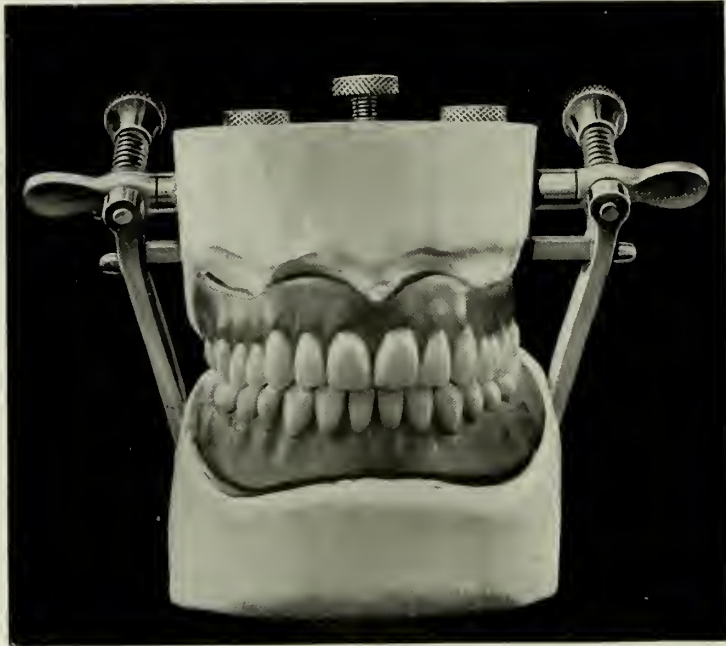
FIG. 12B.

Shows how the upper model is secured to the top bow of the articulator.

APPENDIX (A1 continued).

I am glad to see that our leading manufacturers are now giving the subject of natural appearance and anatomical usefulness of artificial teeth the attention which it has so long called for ; and consequently the output of really "natural form" and "anatomically correct" teeth is largely on the increase.

FIG 13A.



ASH'S ANATOMICAL TEETH MOUNTED ON MORTON'S ARTICULATOR. FULL FRONT VIEW.

I still think the lower first premolars are made too wide for natural occlusion to be obtained with them, but fortunately this can be remedied by a little judicious grinding without impairing at all their usefulness or beauty.

Let us now consider what is a truly anatomical form of natural occlusion in which to arrange artificial teeth.

On this point, I think I cannot do better than quote literally from chapter 4 of Mr. Constant's excellent work on *The Naked-Eye Anatomy of the Human Teeth*.

On "Occlusion of the Teeth" Mr. Constant writes: "The long axes of the teeth are not all quite vertical.

"Their inclination varies with the individual, and more markedly with the race.

"In the negro type the premolars and incisors slant towards the lips considerably.

APPENDIX (A1 continued).

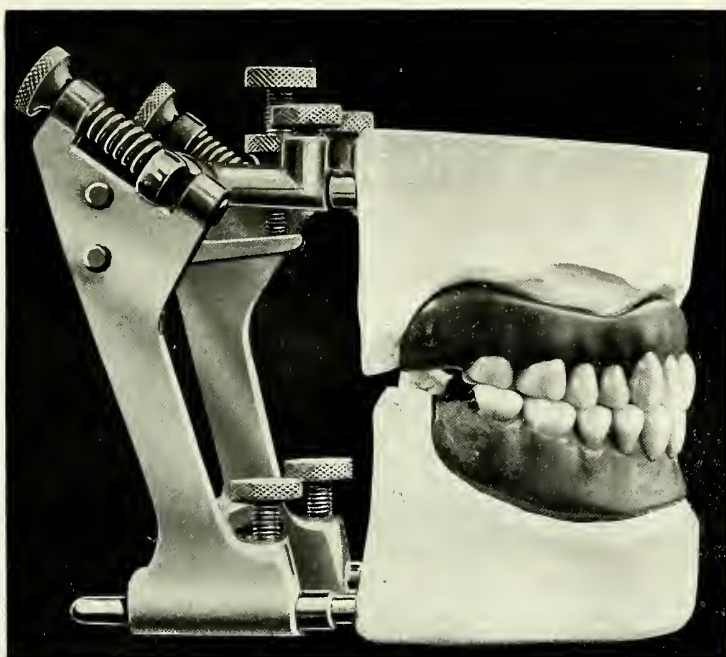


FIG. 13B.

ASH'S ANATOMICAL TEETH ON MORTON'S ARTICULATOR. RIGHT SIDE VIEW.

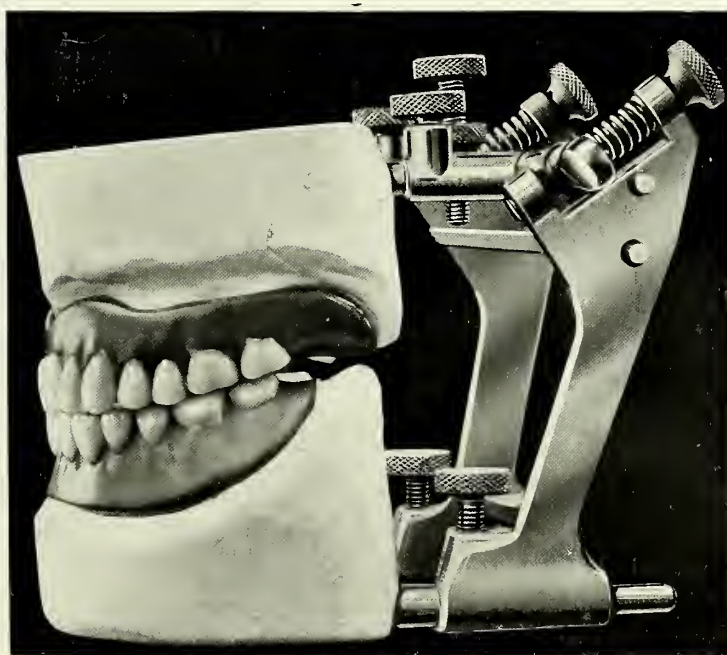


FIG. 13C.

ASH'S ANATOMICAL TEETH ON MORTON'S ARTICULATOR. LEFT SIDE VIEW.
These two views show Contact maintained during the Lateral movement of mastication.

APPENDIX (A1 continued).

"In a typical European denture the lower teeth from the canine back to the second molar are vertical, the third molar being inclined slightly forward.

"The upper teeth from the first premolars to the second molars are vertical, the third molar being inclined slightly backwards and the canines and incisors slightly forwards towards the lips, the incisors also having a slight mesial inclination. . . .

"The centre line of the inferior arch (viz., the point of contact of the lower central incisors with each other) is, or should be, exactly beneath the corresponding point in the upper arch.

"About the upper one-third of the anterior surface of the lower central incisor teeth is concealed by the overlapping of the upper central incisor teeth.

"Since the lower incisor teeth are smaller than the upper, it follows that the upper central incisors overlap the lower central incisors and a part of the lower lateral incisors and canines.

"The lingual surface of the upper central incisors therefore comes into contact with the upper part of the labial surface of the lower central and lateral incisors of the same side, and the lingual surface of the upper lateral incisor comes into contact with the labial surface of the lower lateral incisor and canine of the same side.

"The labial surface of the lower canine also comes into contact with the lingual surface of the upper canine.

"In the teeth of adults all these points of contact are, as a rule, marked by facets, the result of attrition.

"The distal part of the lingual surface of the upper canine comes into contact with the buccal surface of the first lower premolar.

"The distal ridge of the buccal cusp of the inferior first premolar wedges between the mesial ridges of the buccal and lingual cusps of the upper first premolar.

"The buccal cusp of the inferior second premolar wedges between the distal ridge of the buccal and the lingual cusps of the upper first premolar anteriorly, and the mesial ridges of the buccal and the lingual cusps of the upper second premolar posteriorly.

"The lingual cusp of the upper first premolar wedges between the distal ridges of the buccal and the lingual cusps of the lower first premolar anteriorly, and the mesial ridges of the buccal and the lingual cusps of the lower second premolar posteriorly.

"The lingual cusp of the upper second premolar wedges between the distal ridges of the buccal and the lingual cusps of the lower second premolar anteriorly, and the mesio-lingual cusps of lower first molar posteriorly.

"The mesio-buccal cusp of the lower first molar wedges between the distal ridges of the buccal and the lingual cusps of the upper second premolar anteriorly, and the mesio-buccal and the mesio-lingual cusps of the lower first molar posteriorly.

"The buccal cusp of the lower first molar wedges into the central fossa of the occlusal surface of the first upper molar, while the disto-buccal cusp wedges into the distal fossa of the occlusal surface of that tooth.

APPENDIX (A1 continued).

"The mesio-lingual cusp of the upper first molar wedges into the central fossa of the lower first molar, while the disto-lingual cusp is received between the disto-lingual and the disto-buccal cusps of the lower first molar anteriorly, and the mesio-lingual and the mesio-buccal cusps of the lower second molar posteriorly.

"The mesio-buccal cusp of the lower second molar wedges between the disto-buccal and the disto-lingual cusps of the upper first molar anteriorly, and the mesio-buccal and the mesio-lingual cusps of the upper second molar posteriorly.

"The disto-buccal cusp of the lower second molar is received into the central fossa of the upper second molar.

"The mesio-lingual cusp of the upper second molar is received into the central fossa of the lower second molar; while the disto-lingual cusp, if fairly well developed, is received between the disto-lingual cusp and the disto-buccal cusp of the lower second molar anteriorly, and the mesio-lingual and the mesio-buccal cusps of the lower third molar posteriorly.

"Frequently, however, the disto-lingual cusp of the upper second molar is very ill-developed, in which case the mesio-lingual cusp of the upper third molar is received between the mesio-buccal and the mesio-lingual cusps of the inferior third molar; that is, assuming that the upper and the lower third molar are of typical form."

In setting up dentures with the anatomical articulator I arrange the teeth in this natural form, except that in very rare instances only do I put the third molars on an artificial plate. Further, I do not allow the incisors to come quite in contact with one another (unless the bite is to be an edge-to-edge one) in a normal state of occlusion. I so arrange the incisors of the upper and lower, by the aid of Spee's curve, kept in relation to the angles of the articulator, that when the patient's mandible is in a state of partial "direct protrusion," as in biting a piece out of anything, the incisors shall be in an edge-to-edge contact; the contact at the back still being maintained between the inferior second and superior first molars on both sides of the mandible, consequent on the curve of Spee.

This arrangement, while holding the plates steady in the mouth, enables the patient to obtain an efficient "snapping" bite. If nature were to be exactly copied, in regard to the contact of the incisors in a state of occlusion, it is very possible that the upper denture would be tilted from the back of the mouth, during the passage of the lower incisors past the uppers in a protrusive bite, before the action of Spee's curve could come properly into play to counteract it. I also make an exception with regard to the position of the upper and lower incisors by not keeping strictly to the perfectly normal arrangement, but giving the teeth such irregularities as may serve for æsthetic appearances and natural expression. This may be quite safely done without

APPENDIX (A1 continued).

disturbing in the least the true side bite or Spee's curve. but I would recommend the beginner to set all teeth up in the wax in the normal way first, and then to alter the positions of the incisors, to give them a pleasing appearance, before flasking the cases. By this means he will have the support of the back teeth, in conjunction with Spee's curve, to guide him in placing the incisors in *correct irregularity*, if I may be forgiven for using such an apparently contradictory term.

Nothing looks worse than artificial teeth arranged to resemble a row of soldiers or tombstones; hence the concession, in mounting the teeth, to the pleasing abnormality or variety of nature. I generally find that in the sets of artificial teeth at our disposal I have to grind a little narrower the lower canine and first premolar in order to get them to fit into their proper anatomical position; also that it is necessary to grind the distal edge of the lower canine, and the disto-buccal and the disto-lingual cusps of the first and second lower premolars, and, slightly, the mesio-buccal and the mesio-lingual and buccal cusps of the first and second lower molars.

The upper teeth need not be ground at all.

However complicated the theory of Spee's curve and the side bite may appear to be, its attainment with such an articulator as I have described is perfectly easy.

Following the slight mesial inclination of the superior canines, the first superior premolars are to be brought very slightly lower down.

The mesio-buccal cusp-slopes of the first and second premolars and of the first and second molars of the mandible must all be placed at an angle equal to that of the articulatory path of the artificial condyles (in Mr. Morton's articulator it is 35 degrees).

This angle of the cusp must slope, as the articulatory angle does, directly from front to back. Spee's curve will then be found to reproduce itself quite naturally as the work is proceeded with—that is to say, as we keep testing the angle path of the condyles, first on one side, then on the other, to assure ourselves that equal contact is being maintained on each individual tooth which we place on the wax base-plate and on all the others already *in situ*, as it should be in a true side bite. We find that we are compelled to arrange the artificial teeth on each side of both the maxilla and the mandible in the form of two curves which fit into one another; the curve of the maxilla being convex and that of the mandible concave.

Furthermore, it will be noted that this curve varies in every case, being in some cases much shorter than in others, according as to whether the patient has a long or a short mandible. In this way is truly reproduced the curve of Spee in each particular case—see Figs. 4 and 5.

These are a few edentulous cases in which, owing to the shape and condition of the alveolar ridge, we shall not be able to reproduce Spee's

APPENDIX (A1 continued).

curve accurately, and thus we shall not obtain a true side bite; but in these cases we may be sure that we are only reproducing their natural order, and that the maxillæ never had Spee's curve or a side bite when the natural teeth were standing in them.

In partial cases we are limited in our designs of reproducing exact normality by the conditions which already exist in the mouth, consequent on the standing teeth; but it is undoubtedly of great service to be able to reproduce on the articulator the exact movements of the mandible in each particular case, and thus to place the artificial teeth in such relation to the existing bite movements as will enable them to be of the utmost service during mastication; also to be able so to arrange them that they will be unlikely to be broken from the plate during any articulatory movements of the mandible.

The use of the anatomical articulator is not confined to vulcanite work; it is just as possible to produce as good results with a combination of metal and vulcanite, with Dowel crowns, with Ash's non-platinum tube back teeth, or with an all-tube tooth case, but I cannot recommend the use of gum-block teeth or sections.

The purpose of this paper has nothing to do with that other branch of the prosthetic art—the restoration of facial expression and contour, by means of artificial gum, plumpers, etc., which is almost of equal importance if we would produce a really comfortable æsthetic denture; suffice it to say that I recommend the dentist who studies the anatomical occlusion and the articulation of his cases to give due thought also to this other matter: it is well worth it.

I have not endeavoured to show how to make dentures easily or more rapidly than usual, nor yet more cheaply—rather the reverse; but I have endeavoured to show how dentures can be improved, made really more useful, and better looking “anatomically.”

Such work raises prosthetic dentistry to a high art. It is work that cannot be scamped, or done against time; yet I strongly recommend it to every professional man who has the interests of his profession and his patients' interests at heart; and it will surely bring its own reward, in greater satisfaction, a better-class practice, and a correspondingly better fee than less scientific and practical work.

To the dentist who cares to take this study and style of work up, I would say: Do not be discouraged, if at first it seems a lot of effort for little result, or if at first your side-bite cases are not an unqualified success; it will take a little while for you and your mechanics to get used to this class of work, but once learnt it comes easy enough, and calls for very little more trouble than the old order of dentures. Remember that of these dentures even your first failures will be quite wearable, and probably better anatomically than any dentures which you turned out with the old slab-bite or plain-line articulator.

APPENDIX (A2).

SIMPLEX ARTICULATOR.

(DR. C. E. LUCE'S PATENT.)

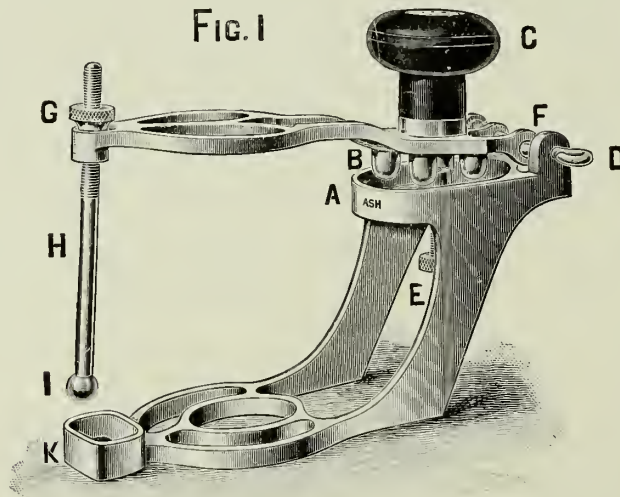
FOR UNIVERSAL USE—SUITABLE FOR ALL CASES.

The foregoing paper, by Mr. C. W. Robinson, deals with an anatomical articulator which has a joint to give an "average" condyloid path and to reproduce approximately correct lateral movements.

Dr. C. E. Luce's paper, which appeared as a reprint from the Dental Review in "Ash's Monthly" for November, 1911, describes an articulator upon which the masticatory movements of each particular case can be reproduced.

In regard to the use of his articulator Dr. Luce writes:—

"With the Simplex Articulator the mandibular relations which exist in mastication can be reproduced with absolute accuracy to each individual case. It is thoroughly practical, and easily understood by anyone conversant with the setting-up of artificial teeth in the usual way.



ARTICULATOR COMPLETE.

- F—Slide Hinge Tubes.
- G—Lock Nut.
- H—Guide Pin.
- I—Tracing Knob.
- K—Record Cup.

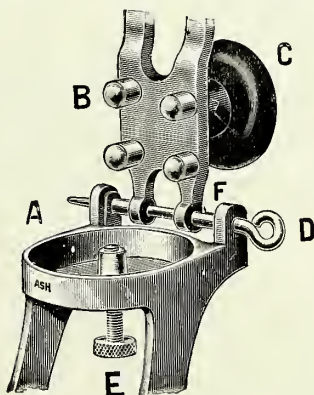
"Fig. 1 shows the Simplex Articulator, which is a pattern not unlike those in general use to-day, with certain additions. The ability of this articulator to reproduce the masticating movements of the mandible rests

APPENDIX (A2 continued).

entirely in the record tray A, which contains a record in impression composition of these motions, which has been transferred directly from the bite taken in the mouth; the round tracing points B, which have traced the record, are kept in contact by pressure applied with the hand at C. To reproduce these movements, the hinge-joint, which is otherwise used during the approximate articulation of the teeth, is disconnected by drawing out the pin D; pressure applied at C maintains accurate contact of the four tracing points B in their tracings, and the movements of the mandible may be reproduced with absolute fidelity.

"I will now indicate the proper procedure with the articulator in a practical case. Let us imagine a full superior and inferior denture for an edentulous patient. It is decidedly better to complete the lower set in advance, due care being taken that the morsal curve is correct, and the cusps of the posterior molars sufficiently inclined lingually, as found in a normal, natural articulation. If it be impracticable to complete the lower set first, we proceed as follows:—

"Upon the inferior model a stable base-plate (preferably the shellac or swaged soft metal plates in general use) is prepared, and the wax is built up and contoured as is usual in taking the bite; the morsal plane must be contoured on the same lines as the finished plate, and this plane of articulation must never be changed. Half-round brass-headed nails (L, Fig. 2)



OPEN VIEW OF BACK PORTION OF FIG. 1.

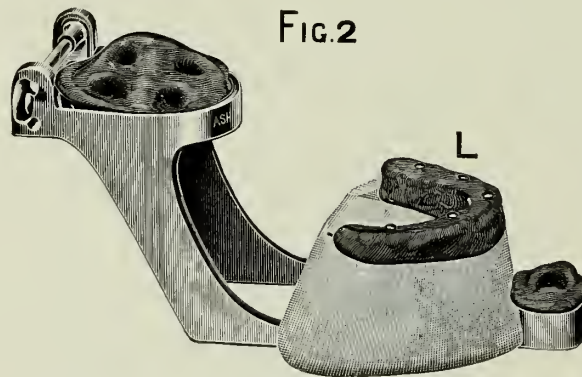
- A—Record Cup.
- B—Round Tracing Knobs.
- C—Handle.
- D—Hinge Pin.
- E—Set Screw.

are now embedded in the morsal surface of the wax, taking the places of the grinding surfaces of the teeth which will later replace them; these round-headed nails are used simply to obtain a clear-cut record of the masticating movements on the morsal surface of the upper plate, as will be described.

APPENDIX (A2 continued).

The lower plate is now ready to take the bite. It must first be thoroughly chilled in cold water to prevent any change in shape during the operation, and it must not be left in the mouth long enough to become softened.

"The inferior trial plate finished, we turn our attention to the superior plate. A stable base-plate is prepared and the wax bite is built up as usual, proper care being taken of all contours; both base-plates are now tried in the mouth and the wax is trimmed to approximate the bite. After removing it from the mouth, the bite-plate is now covered on the smooth side with a thin layer of wax—a half-centimetre is sufficient. After the wax has been well chilled in cold water, the bite-plate with the layer of softened wax is put in place, and both base-plates are again inserted into the mouth of the patient, who is instructed to close in the usual way for taking the bite, which I do not here need to describe further; the lower teeth, or the round-headed nails, if used, must bite through the softened wax and strike the bite-plate. The patient is now directed to make the normal lateral masticating movements, from either side into the middle—or close bite—which are repeated several times; the patient soon has the sensation that the teeth are gliding along a given channel, which is, in fact, the mandibular movement



Lower part of Articulator with the depressions in cups A and K made by the knobs B and I. The heads L of the brass nails are clearly seen on the bite-block.

which is now recorded upon the wax. When removed from the mouth, if too much material has not been used, the record will be clear and distinct, and both models may now be set into the articulator in the usual way, care being taken that the lower teeth rest normally in the impression of the closed bite.

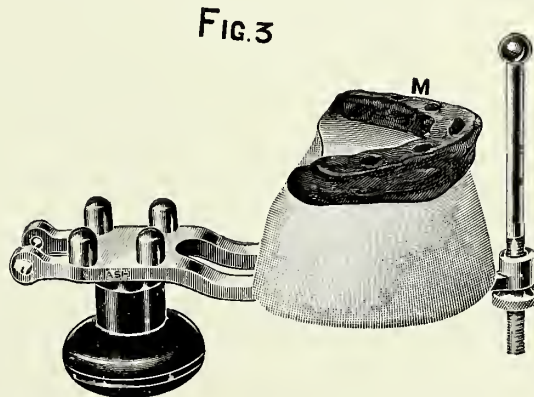
"The register tray A is now filled with softened impression material, the surface is dusted with powdered gum tragacanth, and the four registering points are brought into contact with the surface. The upper part of the articulator, being freed of its hinge-joint (remove hinge pin D), has now free motion in all directions, and being held in contact with the lower part by pressure applied only over the bite, it is apparent that the lower teeth, resting in the imprints on the bite-plate, will control its movements, and that these

APPENDIX (A2 continued).

will be traced on the surface of the impression material in the tray. The upper part of the articulator is therefore moved about, following the movements of mastication, and we shall find a perfect record of these motions has been traced on the surface of the impression material in the trays, A and K, which is now removed and chilled in cold water; in most cases the impression material will serve as a durable record enough, but a more durable record can be obtained if fusible metal be used.

"The tray being replaced in the articulator, with the burden of pressure resting in the record of the trays, we shall now be able to reproduce all the movements of mastication.

"The teeth are now set up in the usual way, using the pin and hinge-joint; and with the teeth set up to the closed normal bite, the hinge-joint



Upper part of Articulator with trial plate and bite-block on model, also the piece of softened wax on the bite-block with depressions M in it made by the heads of the brass nails L, Fig. 2.

is disconnected, and, by warming the teeth, they may be pressed into such positions as will accommodate them to all the movements of mastication.

"It is not easy in a description such as this to cover all the details, but I trust that the simplicity of this articulator will aid in making it readily understood.

"In conclusion, this device, like any other, will require practice, and a nicety of touch to ensure good results; it is undoubtedly far from perfect, but as far as I know it is the only articulator thus far produced which is capable of recording and reproducing actual, individual masticating relations."

After the cases have been vulcanized and finished they are once more placed in the articulator, a piece of articulating paper is put between the teeth and, the recorded movements being again used, the markings made by the articulating paper will show the points, if any, where grinding has to be done to perfect the articulation.

TO GRIND AND POLISH
ASH'S MINERAL TEETH.*

BY R. P. LENNOX, OF CAMBRIDGE.

Although Ash's Mineral Teeth have now been before the profession since 1837 and many references are made in dental literature to the fact that they are of the same non-porous texture throughout, and can therefore be ground and polished to any extent that may be desired to suit special cases, it is yet remarkable that no writer has attempted to give definite instructions for grinding and polishing them.

By way of introduction to making such an attempt, I may say in the first place that the density of Ash's mineral teeth permits of their being ground to a very fine edge without the risk of chipping; and, if necessary, the ground surface can afterwards be highly polished. A further advantage is the absence of the particles of porcelain which in some teeth are found encroaching upon the pins, to remove which, when backing teeth, involves annoyance and loss of time.

To Grind the Teeth.—For this purpose I use carborundum wheels running in a trough of water when doing the work in the lathe, and carborundum wheels and points when doing it with the dental engine.

The use of carborundum pretty well does away with the need for a steel tool in countersinking, but where a lathe or dental engine is not at hand, the teeth may be countersunk by means of a graver and camphorated turpentine, into which the graver is dipped from time to time.

To Polish the Teeth.—Smooth down the surface with one of Ash's Tan Stones, either in the Lathe or in the Engine†; follow on with a buff wheel and superfine pumice—a little soap pressed against the buff wheel is an advantage—and give the final polish with a soft lathe brush and whiting.

This method of polishing produces a surface on the teeth which is equal to the original surface.

* See ASH'S QUARTERLY CIRCULAR, June, 1896.

† Every well-equipped workshop should be provided with a dental engine.—R.P.L.

APPENDIX (A1 continued).

EQUIPMENT FOR USE WITH THE DENTAL LATHE.

- (1) A carborundum wheel for grinding the tooth to shape.
- (2) An Ash's Tan polishing wheel for removing the marks left by the carborundum and for smoothing the ground surface.
- (3) A brush or buff wheel, some superfine pumice or putty powder, and some whiting for polishing. NOTE.—Water to be used at every stage.

EQUIPMENT FOR THE DENTAL ENGINE.

- (1) Carborundum wheels and points.
- (2) A Water of Ayr Stone or an Ash's Tan polishing stone.
- (3) A brush or buff polisher, some superfine pumice, &c., as under No. 3 above.



EQUIPMENT FOR HAND USE.

- (1) A half-round carborundum file.
- (2) A Water of Ayr Stone.
- (3) A hand buff, some superfine pumice, &c., as under No. 3 of dental lathe equipment.

ASH'S TAN POLISHING STONE.

With this stone a smooth and polished surface can be imparted to our Mineral Teeth after they have been ground.

We do not know of any stone which is equal to it for this purpose. It is tough, though soft; does not chip, like most other stones do, and will stand long and hard wear if it be kept well wetted with water during use.

It fits the Lathe Chucks of our manufacture.

FIG. 2.



ASH'S TAN POLISHING STONE.

APPENDIX (C).

SOME HINTS AND IMPORTANT POINTS ON
THE BACKING OF TEETH.

BY G. W. ROSE.

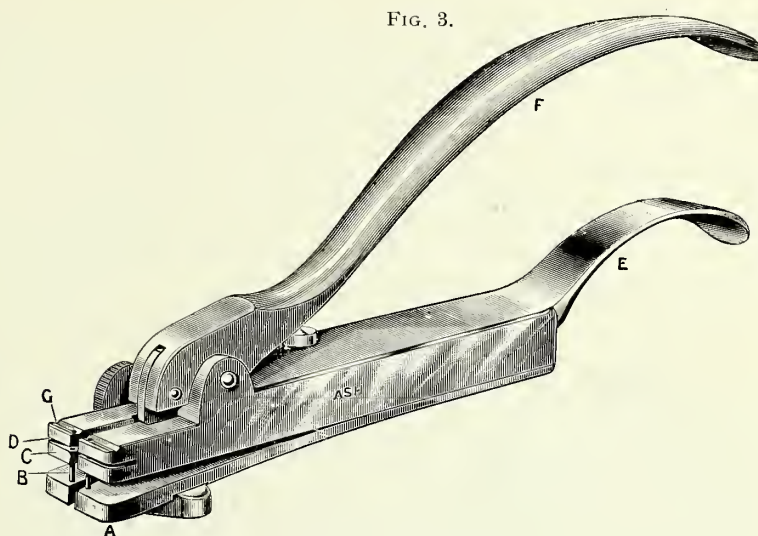
Often too little attention is paid to this branch of mechanical work, and yet upon the method employed the ultimate success or failure of the whole denture depends.

In order to save trouble, we must first take trouble. There are many methods adopted for attaching a metal backing to a tooth, and much delay and inconvenience are often caused by lack of observation and attention to detail. It must be understood that fitting a piece of metal to the back of a tooth is not necessarily backing the tooth, and that in order to get real support the backing must be in absolute contact with the mineral of the tooth at every part, such as is obtained when gold is cast upon a tooth. If a tooth be broken off a cast gold plate, it will be noticed that every little pit or depression in the mineral is outlined upon the gold backing. This perfect contact lends great support to the mineral of the tooth, and greatly lessens the strain upon the platinum pins.

The practice of using the single pin perforator is fruitful of much failure, since in punching the holes one at a time it is difficult to get them quite parallel and the right distance apart. The plan usually adopted is to touch the ends of the pins with a little rouge, which marks the gold when the pins are pressed upon it and thus indicates where the holes are to be punched. In doing this, however, the dots of colour are often slightly spread. This makes them larger than the pin-holes are required, and consequently adds to the difficulty of obtaining the proper distance between the holes, with the result that when they are punched the pins do not fit snugly, and, as the holes have to be broached out to remedy the defect, room is unfortunately produced which allows the solder to flow easily behind the backing. In such cases it is obvious that the backing cannot be in close contact with the tooth.

The best tool for use in punching holes in teeth backings is the perforator invented by Mr. J. C. Young, of Warrington, with which two holes can be punched at one punching, not only rapidly, but with mathematical precision, and with exact correspondence between the holes in the backings and the pins of the teeth to be backed. It also provides for the quick, and easy disengagement of the plate from the perforating pins after punching; thus the difficulty of separating, without twisting or injuring the perforated plate, is entirely removed. By its use the risk of fracture in backing teeth is reduced to a minimum; no measuring is required; the tooth is its own gauge, and the holes are in perfect alignment with the pins.

APPENDIX (C continued).



YOUNG'S PERFORATOR.

- A—Screw which holds the back plate that clamps the pins.
- B—Pins.
- C—Intermediate Plate with holes which support and stiffen the Pins.
- D—Slotted recess into which the metal backing is placed.
- E—Lower Lever.
- F—Upper Lever.
- G—Groove in upper plate with holes into which the tooth to be backed is placed before punching the backing.

After an experience of many years with this perforator we feel that it is impossible to overestimate its value; we consider that it is indispensable for the successful backing of teeth.

Before finally fitting the tooth to the backing, great care must be taken to remove all traces of wax, for if any particle of wax be left on or around the pins it will carbonise, and experiments undertaken by Professor Hartley, of Dublin, showed that minute particles of carbon caused platinum pins to become crystalline and brittle.

We understand that some workers habitually paint the backings with a layer of borax before fitting them to the teeth. This practice, in our judgment, is reprehensible and should be most carefully avoided.

As we have already stated, the metal backing must be in absolute contact with the back of the tooth. The only way of successfully accomplishing this to perfection is by swaging.

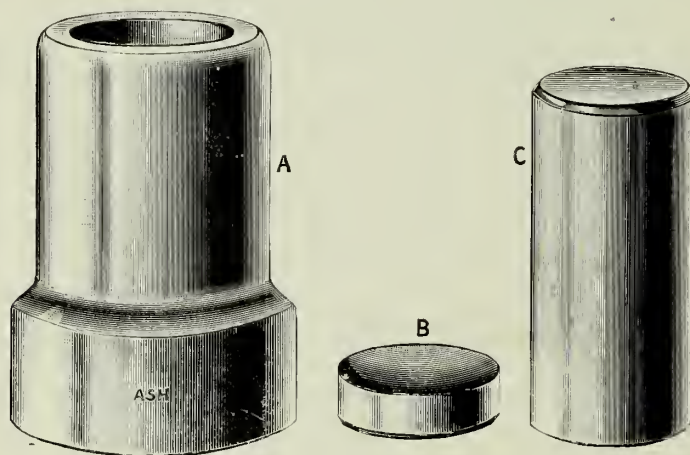
To swage a backing—Take a piece of gold leaf, No. 40 or No. 60, cut it to size, press it over the back of the tooth and pins with the fingers, then place it in position between the hard blocks in Ash's Crown Swager (Fig. 4), and swage home in a large size flask press, or by striking with a hammer. After this, fit a thicker backing over the foil, about Ash's size No. 6, of 16-carat gold

APPENDIX (C continued).

plate which has previously had the holes punched in it with Young's Perforator (Fig. 3). Before this thick backing is put on the tooth the holes should be countersunk on the surface which goes against the tooth. When the backing is fitted, the pins should be bent over at right angles and the swaging completed. It is important to avoid the use of backings which are too thin, because the flexibility of thin metal may cause fracture of the teeth.

Backings of gold foil are frequently swaged upon teeth and thickened-up with gold solder. This practice is to be condemned, as the contraction of the solder is likely to cause trouble, and adds greatly to the risk of fracture.

FIG. 4.



ASH'S CROWN SWAGER.

A—Body of Swager; B—Bed-Plate; C—Plunger.

When the backings have been perfectly fitted to the teeth, it is most important that they should be equally well fitted to the plate, secured to it with Sticky Wax (Model Cement) and carefully invested.

The conditions necessary for successful soldering are:—

- (1) A clean, bright surface along which the solder is to flow;
- (2) Contact of all the parts to be united;
- (3) A suitable solder for the case in hand;
- (4) Avoidance of excess of solder;
- (5) A flux free from impurities; and
- (6) A heat which is gradually and uniformly distributed.

The gradual and uniform distribution of heat is of the utmost importance in all soldering operations.

The invested case should be slowly heated until all moisture has been given off, and the borax begins to boil.

The blowpipe flame should then be played all over the case and finally directed upon the solder.

APPENDIX (C continued).

If the case is allowed to remain upon the Bunsen burner beyond the drying-off stage, further heating causes rapid and excessive oxidation, and the oxide thus formed is likely to be absorbed by the platinum pins and to render them brittle and liable to fracture.

Again, if the case is overheated, the excess of heat in the investment will draw the solder through the pin holes to the tooth side of the backing. This produces a slight displacement of the backing which almost invariably stretches the platinum pins, and when platinum above a certain heat is stretched, it loses its tensile strength and is easily broken.

NOTES ON PIN-BENDING.

FLAT TEETH

FOR PLATE AND VULCANITE WORK.

Our **Flat Teeth** are made with long platinum pins, and are equally suitable for either Plate or Vulcanite work.

FIG. 6.

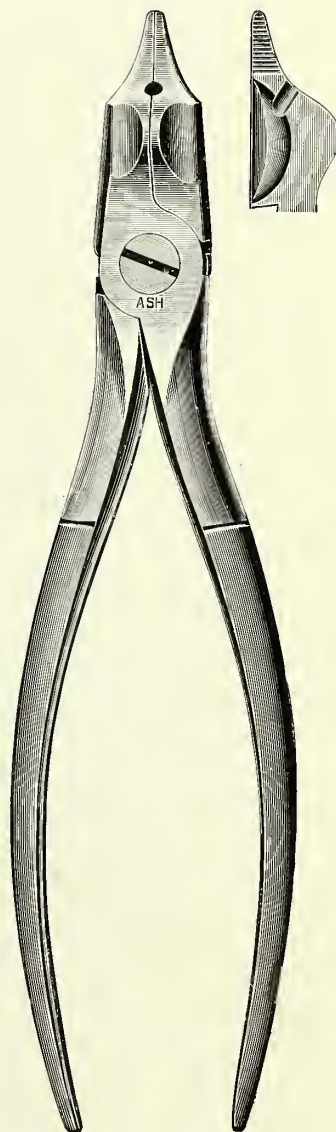


When they are used for Vulcanite work, the pins should be bent as nearly as possible at right angles (see **A**, Fig. 6), and in such a direction that they will grasp the Vulcanite in the thickest part. In the several illustrations given above, **BB** Fig. 6 show the most usual bends.

The pins should be bent with the pin-roughing and bending pliers here illustrated.

Our **Vulcanite Teeth** are also made with long pins, and with headed pins. The long pins should be bent as described above, but the **Headed pins** do not require to be bent.

FIG. 5.



FULL SIZE.

THE CRACKING OF TEETH IN SOLDERING.

By GEORGE J. GOLDIE, L.R.C.P., L.R.C.S., L.D.S. EDIN.

Of all the accidents to which metal work is liable, perhaps the most vexing is cracked teeth. Nothing can be more annoying than to see hours of good work thus rendered useless in the final soldering. In considering the causes of such mishaps, we of course put out of court such factors as carelessness, undue haste in drying, etc., as irrelevant, and proceed at once to examine the more important ones, viz., boraxing and investing. The application of borax, although it may seem a matter of no account, is yet a more serious operation than a mere glance would warrant one in supposing; it seems to me to be the only really difficult part in soldering, and accordingly it admits of no neglect.

The careless use of borax as a flux produces two kinds of cracks in porcelain; firstly, the crack which runs most usually from end to end of a tooth; and secondly, the crack which is confined to the edges in apposition to the gold backing. The first of these, the more deadly of the two, is due to the presence of borax between the tooth and the backing, and as it most often reaches that position by means of the pin holes in the latter, its ravages can be easily cut short by care in "backing" the tooth. The second kind is not quite so easily accounted for. It is difficult to explain why the mere contact of borax with porcelain and gold under a red heat should result in a crack, but that it is so has been proved by experience. If, in a backed tooth, borax be allowed to flow over the edge of the backing on to the tooth substance, a hair-line crack will be found in the latter, running more or less parallel to the former and marking the limit of the borax invasion, thus showing that the crack is directly due to the flux. Borax seems to be so adhesive that after being flown by the flame it draws away a thin layer of porcelain as it contracts in cooling, producing the crack described. Such fractures are deep or shallow, away from or close to the gold, according to the amount of flux at fault, and their remedy is to be found in careful investing. While these remarks are true of ordinary plate-work, they are more true concerning crown and bridge work, where the high grades of solder and gold will necessitate the use of higher temperatures in soldering.

It will now be seen that all joints should be made flux-tight. Where surfaces are to be made continuous by solder, as when a tooth is attached to a plate, or, in crown and bridge-work, when the porcelain facing is to be joined

APPENDIX (D continued).

to the cap, the point of contact must be made as small as possible by fine-fitting, and any space which may then be present ought to be filled with gold foil ; this, however, need not be condensed to the solidarity of a filling in the mouth. Needless to say, the porcelain must be all hidden by the investing material. Now comes the application of the flux.

Borax can be used in two forms, viz., as a vitrified powder got by driving off the water of crystallization from ordinary borax and calcining the resultant clear mass, and as a mixture with water made by rubbing a piece of borax on a moist slab. Each of these has its good points. The powder being thoroughly dry does not swell when heat is applied to it, so that even if it should manage to get in between a tooth and its backing no crack will result ; here it is distinctly better than its ordinary moist rival. A combination of the two, however, seems to answer best. The surfaces to be soldered, having been thoroughly cleaned, should be sparingly painted with some of the moist form mixed very thick (care being taken not to touch the investment), and over this some of the powder should be dusted. The piece may then be dried and soldered in the usual way, and if any more flux be required during the operation, the powder should obviously have the preference.

As regards the investing material, a word may not be amiss. It will be noted above that it must be kept free from borax. The reason why I emphasise this is that, should the error of deluging metal and investment indiscriminately with the flux be committed, the operator will find on using the blowpipe that the surplus borax will flow into the porous investment, and, sinking in, will drive it before it, and so lay bare the edges intended to be covered. This of course will produce the small edge cracks before mentioned. The investing material which gives the best results is marble dust in combination with plaster. It forms a hard solid investment, and has the advantage over its softer compeers—such as asbestos—of being less porous, so that even should borax get on to the parts round the backing (and it is sometimes difficult to avoid), the denudation of the porcelain is not so great as when other materials are employed.

ON VULCANIZING.

The great object to be attained in Vulcanizing is not to see in how short a time the wonderful chemical changes, which take place during the process, can be effected, but to conduct the operation in such a manner as to secure the greatest possible amount of strength and elasticity in the rubber.

In Vulcanizing all our rubbers, except Vela and the Repairing Rubbers, from 30 to 45 minutes should be occupied in very gradually raising the temperature to 315° Fahrenheit, when a Thermometer is used, or 100 lbs. pressure, when a Steam Gauge is used, and this temperature or pressure must be maintained for a further period of 75 minutes to complete the Vulcanizing process.

If a Thermometer and Gas-Regulating Gauge be employed upon the same Vulcanizer, the temperature registered by the Thermometer should be followed as the standard, and the Gauge only employed for regulating the Gas—*see page 173.*

The Fusible Metal Plug which is inserted in the lid of all our Vulcanizers will not be blown out until the temperature exceeds 350° Fahrenheit or 130 lbs. pressure. In addition to this plug there is another in the side of the chamber which will not fuse until a higher temperature or pressure is reached than is ever required for vulcanizing dental rubber.

The India-rubber packing should be thoroughly chalked on the surface every time the Vulcanizer is used, to prevent adhesion. It requires to be renewed occasionally, to keep the chamber steam-tight.

The Tube in which the thermometer is placed should be half-filled with mercury, so as to surround the bulb and thereby ensure a correct register of the heat.

The Syphon of a gauge should be filled with water when first used, and afterwards kept filled.

If wet plaster only is used for the generation of steam, the quantity required in two Flasks will be found sufficient, but if only one Flask is put in the Vulcanizer a lump of wet plaster should be added. When free water is employed, a quarter of a pint is sufficient for all our Vulcanizers. We may, however, add that we consider wet plaster far preferable to free water when the Vulcanizer is in good order. If the Vulcanizer be faulty, wet plaster will not serve the purpose, nor can any given quantity of water be mentioned which would be uniformly suitable.

HOW TO USE THE GAUGE AND THERMOMETER TOGETHER IN VULCANIZING.

We are so frequently asked why the Gauge and Thermometer, when used together in vulcanizing, do not agree, that we think it desirable to state that it is not possible to obtain permanent agreement between them.

Should they by chance agree when they are both new, the agreement will not last very long, owing to the fact that the Bourdon tube in the Gauge becomes gradually weakened by continued use.

We ourselves always use a Gauge and Thermometer together, but we never rely upon the Gauge for temperature or pressure; we simply employ it as a gas-regulator and as a useful aid in fixing the Thermometer at a given temperature. Our plan of using them together is as follows:—

We set the **red** hand of the Gauge, say, at 100 lbs., put the Thermometer in a bath of mercury in the Thermometer tube and gradually get up the heat until the Thermometer registers 315 degrees Fahrenheit—the temperature recommended for vulcanizing nearly all our Dental Rubbers.

If the **blue** hand on the Gauge has not reached the **red** hand when the Thermometer registers 315 degrees Fahrenheit, we turn the **red** hand back to within a point of the **blue** and leave it there.

On the other hand, if the Thermometer does not register 315 degrees Fahrenheit when the **blue** hand of the Gauge has reached the **red** at 100 lbs., we advance the **red** a little to allow the **blue** to go forward until the Thermometer does reach 315 degrees Fahrenheit.

The **red** hand is then left at this point and the Vulcanizer is used with Thermometer and Gauge without any alteration until we find that the Thermometer fails to rise to 315 degrees Fahrenheit; when this occurs, we slightly advance the **red** hand to admit of the Thermometer reaching 315 degrees Fahrenheit.

By using the Gauge and Thermometer together in this way, we never trouble about the weakening of the Bourdon tube; for so long as both Gauge and Thermometer are intact we are quite sure, not only theoretically, but also by practical results, that we always work at 315 degrees Fahrenheit, and nothing is easier than to advance the **red** hand a point or two from time to time as occasion requires to allow of the Thermometer always registering 315 degrees Fahrenheit.

(N.B.—315 degrees Fahrenheit are equal to 157 degrees Centigrade.)

APPENDIX (F).

ASH'S PORCELAIN ENAMELS, FOR SHADING MINERAL TEETH AND INLAYS.

These Porcelain Enamels are made from the same material as our Low-fusing Mineral Body.

They are very fine in texture and can be most easily spread over the surface of Mineral or Porcelain Teeth.

They can be fused on to any make of teeth, and are warranted not to wear off in the mouth. Their fusing point is about $1,600^{\circ}$ Fahrenheit (871° Centigrade), and when they are properly fired they become so permanently a part of

FIG. 7.



the teeth which are coated with them that they will stand any test to which they may be subjected, either in soldering or vulcanizing. To keep such teeth perfectly clean it is an advantage to press a small piece of gold foil over them, with the fingers, before soldering or vulcanizing.

The simplicity of the Outfit and of the Enamelling Process brings this beautiful work within the practical reach of every Dentist.

APPENDIX (F continued).

We supply them in the following 8 colours:—White, Grey, Blue, Dark Green, Dark Brown, Light (Italian) Brown, Black, Yellow, put up in bottles and packed in a neat cardboard box.

To mix the colours:—Mix the colours on the porcelain palette with an Agate, Ivory or Bone Spatula, add sufficient mixing liquid (Oil of Cajepu) to render plastic, and work the mixture with the spatula until it is thoroughly smooth and thin.

The colours White, Grey, Black, should be thickly applied to the teeth, but Green, Blue, Yellow and the Browns must be thinly applied, in order to obtain the best results.

To ensure a uniform layer after painting, when using the Yellow shade to colour the neck of a tooth, hold the pins of the tooth with a pair of tweezers, invert the tooth and give the tweezers a tap or two with the spatula; this will cause the enamel to flow evenly over the surface of the neck of the tooth.

To test a Shade:—Before applying the mixture to the teeth which are to be shaded, test it on a useless tooth or piece of porcelain to see whether it is the right tint. When the right tint is obtained, carefully paint it on the teeth to be shaded with a camel-hair brush, let the material dry naturally and then fire in any suitable gas furnace or in any electric furnace until the teeth are well glazed.

The depth of shade desired is obtained by varying the thickness of the enamel when painting it on the teeth.

Gum Teeth:—A good imitation of the natural gums can be produced by using our High-fusing Gum Enamel, No. 159 B.

Defects in the Teeth:—By drilling or grinding the surfaces of Artificial Teeth with a Diamond Disc, a Diamond Drill or a Diamond Bur, and afterwards applying an enamel, and firing, pits and grooves in the enamel of Natural Teeth can be effectually imitated.

For Tinting Mineral Inlays and Crowns:—Should the colour of an Inlay or Crown not be a satisfactory match, it can be tinted to the desired shade with one or other of the enamels.

General Remark:—In the hands of the artistic worker, there is hardly any limit to the possibilities and usefulness of these Porcelain Enamels. It is scarcely necessary to add that a number of intermediate shades can be obtained by blending the colours which we supply.

The outfit consists of 8 bottles of Porcelain Enamel, 1 bottle Mixing Liquid (Oil of Cajepu), Ivory Spatula, Porcelain Palette, 2 Camel-hair Pencils and Nickel Tray.

Note.—The Camel-hair Pencils should be cleaned with Turpentine before being used for applying a fresh colour.

As an extra to the outfit, our Gum Enamel, No. 159b, is most serviceable for veneering the cervical border of Teeth and Crowns.

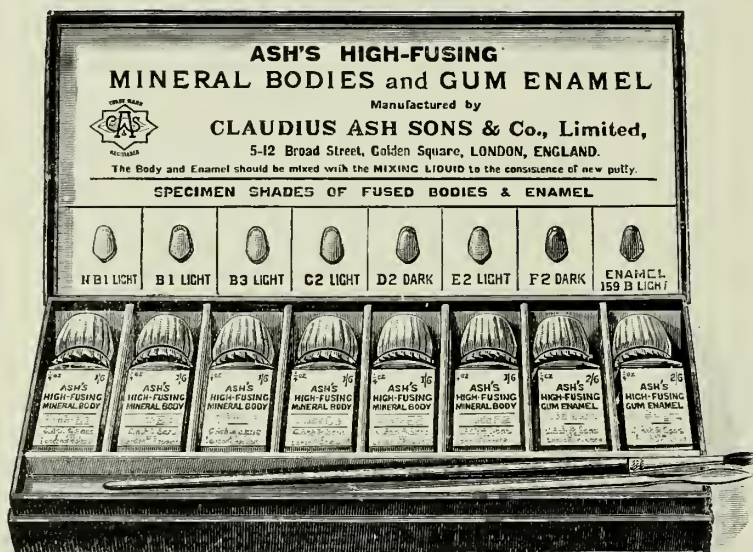
APPENDIX (F continued).

ASH'S HIGH AND LOW-FUSING MINERAL BODIES AND GUM ENAMELS,

SPECIALLY PREPARED FOR INLAYS AND CROWNS.

Our High-Fusing and Low-Fusing Gum Bodies and Enamels are invaluable to the dentist, not only for use in making Inlays and Crowns, but also for converting stock teeth into crowns, for lengthening teeth at the cervical edge, for building it up with gum enamel, and for many other useful purposes.

FIG. 8.



The Outfits are supplied with the following shades in them:—

High-Fusing—Light part of, NB/1, B/1, B/3, C/2, E/2; dark part of, D/2, F/2.

Low-Fusing—Light part of, B/1, B/3, C/3, E/1, F/2; dark part of, B/2, D/2.

But any of the shades mentioned on page 177 can be had to order instead of the shades here enumerated.

The fusing points of these Mineral Bodies are as under:—

High-Fusing—About 1,950° F. = 1,066° Centigrade.

Low-Fusing „ 1,550° F. = 843° „

Foundation Body—About 2,150° F. = 1,177° Centigrade.

Continuous Gum Body—About 2,100° F. = 1,149° „

APPENDIX (F continued).

ASH'S

LOW-FUSING MINERAL BODIES

FOR INLAYS AND CROWNS.

PREPARED IN 72 SHADES.

The **Light** shades approximately correspond to the cutting edge, and the **Dark** shades to the neck of the Teeth in our Set of Shades, although as supplied in their separated form they necessarily appear more pronounced than the same shades blended in our Mineral Teeth.

LIGHT SHADES.

DARK SHADES.

LIGHT PART	B 1	B 2	B 3	B 4	B 5	DARK PART	B 1	B 2	B 3	B 4	B 5		
„	„	B×1	B×2	B×3	B×4	B×5	„	„	B×1	B×2	B×3	B×4	B×5
„	„	NB1	NB2	NB3	—	—	„	„	NB1	NB2	NB3	—	—
„	„	C 1	C 2	C 3	C 4	C 5	„	„	C 1	C 2	C 3	C 4	C 5
„	„	D 1	D 2	D 3	D 4	D 5	„	„	D 1	D 2	D 3	D 4	D 5
„	„	E 1	E 2	E 3	E 4	E 5	„	„	E 1	E 2	E 3	E 4	E 5
„	„	F 1	F 2	F 3	F 4	F 5	„	„	F 1	F 2	F 3	F 4	F 5
„	„	—	—	G 3	—	—	„	„	—	—	G 3	—	—
„	„	—	H 2	—	H 4	—	„	„	—	H 2	—	H 4	—

ASH'S

HIGH-FUSING MINERAL BODIES

FOR INLAYS, CROWNS, BRIDGES.

AND PARTIAL AND FULL CONTINUOUS-GUM SETS ARE ALSO

SUPPLIED IN THE ABOVE 72 SHADES.

ASH'S MINERAL TEETH.

DATES OF INTRODUCTION OF VARIOUS KINDS.

- 1837 PLAIN GOLD TUBE AND GUM GOLD TUBE TEETH.
1841-2 FLAT SHORT PIN TEETH.
1845-6 VARIOUS GUM BLOCKS OF TEETH.
1848 TEETH WITH PLATINUM LOOPS.
1850 TEETH WITH GOLD PINS.
1852 TEETH WITH PLATINUM BARS.
1856 TUBE PIVOT TEETH.
1856 PLAIN PLATINUM TUBE AND GUM PLATINUM TUBE TEETH.
1858 FLAT LONG PIN TEETH.
1858-59 VARIOUS FORMS OF PINLESS TEETH.
1858-59 VARIOUS FORMS OF GUM PINLESS TEETH.
1858-62 VARIOUS FORMS WITH PINS.
1859 VULCANITE TEETH WITH SCREW PINS.
1859 VULCANITE SINGLE GUM TEETH.
1859 GUM SECTIONAL TEETH.
1859-60 GROOVED TEETH WITH SINGLE PIN
1860 DOVE-TAILED TEETH.
1860-61 VULCANITE TEETH WITH HEADED PINS.
1868 OPEN CROWN TEETH.
1875 VARIOUS FORMS OF DIATORIC TEETH.
1888 TUBE CROWNS.
1895 STAINED TEETH FOR SMOKERS AND OTHERS
1895 BLACK TEETH AS USED IN THE FAR EAST.
1903 DOWEL CROWNS.
1907 ANATOMICALLY PROPORTIONED BICUSPIDS AND MOLARS.
1908 REPAIR FACINGS.
1913 BRIDGE TEETH.

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